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THE WHITE HOUSE
WASHINGTON

January 3, 1975

Dear Craig:

I want to thank you again for the information on the uranium enrichment problem which you provided me several weeks ago. I have referred it to those actively involved with this matter, and they will give it full consideration.

I know that you will soon retire from the Congress. In my judgment, you have rendered a very great public service, particularly in the area resulting from your extensive and perceptive understanding of the intricacies of uranium enrichment. You have done much to advance the objective of participation by private enterprise in the future of this important segment of our national energy complex, and you have thrown much light on the problems involved and on alternative ways of proceeding.

It has always been a pleasure to work with you, and I wish you everything good in your future activities.

Sincerely,

J. Ford

The Honorable Craig Hosmer
House of Representatives
Washington, D.C. 20515

*P.S. I will continue to monitor myself.
J.*



January 3, 1975

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Sincerely,

JERRY FORD

The Honorable Craig Hosmer
House of Representatives
Washington, D.C. 20515



32 - Role in Uranium Enrichment Problem

RECEIVED
JAN 8 1975
CENTRAL FILES

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

DEC 17 1974

MEMORANDUM FOR JERRY H. JONES

FROM: ROY L. ASH

Attached is a memorandum to the President in response to your memo to me of November 8 regarding papers on uranium enrichment left by Rep. Craig Hosmer.

Attachment



THE WHITE HOUSE
WASHINGTON

DEC 17 1974

ACTION

MEMORANDUM FOR THE PRESIDENT

FROM: ~~ROY L. ASH~~

Subject: Rep. Hosmer's papers on uranium enrichment

This is in response to your note to me, attached to some papers on uranium enrichment recently left with you by Rep. Craig Hosmer, with the notation "What should I do about this?" The papers comprise a) two pages of tabular analysis and b) copies of Hosmer's two recent "essays" on uranium enrichment.

The essential message of the tabular analysis is roughly as follows: "If AEC's uranium enrichment charge to industry is raised to commercial levels, the revenues received over the next 20 years will be sufficient to cover all costs, repay the Treasury for the capital value of its plants, and facilitate creation of a private enrichment industry in the U.S.

Based on our discussion with AEC, Rep. Hosmer's analysis appears to be generally valid over the long term. The draft legislation to enable AEC to raise its charges is nearly ready for transmission to the Congress.

Rep. Hosmer's two "essays" in essence argue that private entry into the uranium enrichment business can succeed only if AEC/ERDA preproduces, over the next 4-8 years, a sufficiently large stockpile of enriched uranium, at considerable cost, to "backstop" the fledgling private firms. We are very much aware of this need.

The Joint Committee on Atomic Energy has recently completed hearings on Rep. Hosmer's bill (H.R. 17418) to create a Government corporation to take over the operation of the AEC plants and to facilitate private entry. The Hosmer bill and the hearing record will apparently be left as a kind of legacy to the 94th Congress.

At NSC's request, there is now in preparation NSSM 209, which will refine and re-evaluate the options for providing future increments of uranium enrichment capacity.

Attached for your signature is a suggested letter to Rep. Hosmer to thank him for the information he provided you.

Attachment



THE WHITE HOUSE

WASHINGTON

Dear Craig:

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I know that you will soon retire from the Congress. You have in my judgment rendered a very great public service, including conspicuously that stemming from your extensive and perceptive understanding of the intricacies of uranium enrichment. I think you have done much to advance the objective of participation by private enterprise in the future of this important segment of our national energy complex, and you have thrown much light on the problems involved and on alternative ways of proceeding.

It has always been a pleasure to work with you, and I wish you everything good in your future activities.

Sincerely,

Honorable Craig Hosmer
House of Representatives
Washington, D. C. 20515



OFFICE OF THE PRESIDENT

WASHINGTON, D.C.

From the President.

To:

Roy Ash

Date:

Time

a.m.

p.m.

What should I
do about this?



THE WHITE HOUSE
WASHINGTON

November 8, 1974

ADMINISTRATIVELY CONFIDENTIAL

MEMORANDUM FOR: ROY L. ASH

FROM: JERRY H. JONES 

The attached material was returned in the President outbox with the following notation to you:

-- What should I do about this?

Please follow-up with the appropriate action and return your response to the Office of the Staff Secretary.

Thank you.

cc: Don Rumsfeld



GOVERNMENT ENRICHING COMPLEXTwenty-Year Financial Summary

Plant Value - \$ 5 Billion
 Inventory - \$ 1 Billion

27.8 Million S. W. U. capacity
 plus 1 million centrifuges

Total Revenues @ \$70/swu 36,001,000,000

Operating Costs

Power @ 10 mills.	12,202,000,000
Labor	1,525,000,000
Misc. R&D	1,525,000,000
In lieu State taxes	<u>1,028,600,000</u>

16,280,600,000

Payments to U. S.

Royalty @ \$3/swu	1,542,900,000
In lieu Inc. Tax @ \$6/swu	3,050,200,000
Interest & Amortization	<u>13,577,700,000</u>

(3%)

18,170,800,000

Subtotal 34,451,400,000

Net Income (To finance CIP/CUP @ \$1 Billion and
 subsidize front end costs of U. S. Centrifuge en-
 riching industry): 1,550,600,000



U. S. ATOMIC ENERGY COMMISSION

C. Hoerner

Revenue Estimates Related to Uranium Enrichment Services ^{1/}
(In Millions)

	<u>FY 1976</u>	<u>FY 1977</u>	<u>FY 1978</u>	<u>FY 1979</u>	<u>FY 1980</u>	<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>
uranium enrichment activity services	\$ 0.9	\$ 0.9	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0
fuel, consumption, etc.	25.2	24.8	24.3	23.9	23.5	23.2	22.8	22.4	22.0	21.7
uranium enrichment services										
Toll enriching	446.4	714.9	764.9	1,076.8	1,376.6	1,733.5	1,793.2	1,854.8	2,089.6	2,309.8
Advance Payments on New Enrichment Contracts	190.3	11.6	-41.9	-99.9	-117.7	-170.8	-162.1	-1.4	-	-
Subtotal Uranium Enrichment Services	<u>636.7</u>	<u>726.5</u>	<u>723.0</u>	<u>976.9</u>	<u>1,258.9</u>	<u>1,562.7</u>	<u>1,631.1</u>	<u>1,853.4</u>	<u>2,089.6</u>	<u>2,309.8</u>
Total Revenues Related to Uranium Enrichment Services	<u>\$ 662.8</u>	<u>\$ 752.2</u>	<u>\$ 748.3</u>	<u>\$1,001.8</u>	<u>\$1,283.4</u>	<u>\$1,586.9</u>	<u>\$1,654.9</u>	<u>\$1,876.8</u>	<u>\$2,112.6</u>	<u>\$2,332.5</u>

The revenue estimates assume that customers holding requirements contracts will convert to long-term fixed commitment contracts prior to FY 1976. The estimates are based on the recently announced price increase to \$42.10 per SWU for long-term fixed commitment contracts and the changes per SWU have been increased at a rate of 2% semiannually in accordance with the revised pricing schedule. Sales of SWU's are estimated on the basis of deliveries under contracts and assume contracting to a sustaining capacity of 320,000 MW(e) pending decision on plutonium recycle. The sales projection for any given year is subject to adjustment depending upon the actual status of power reactor construction and/or operations.

Downpayments:	<u>FY 1974</u>	<u>FY 1975</u>	<u>FY 1976</u>	<u>FY 1977</u>	<u>TOTALS</u>
Domestic	\$ 139.5	162.6	158.9	24.2	485.2
Foreign	<u>41.8</u>	<u>65.3</u>	<u>55.7</u>	<u>21.5</u>	<u>184.3</u> (27.5%)
Total	181.3	227.7	214.6	45.7	<u>669.5</u>

74-77 \$ 2/3 Bil

Revenue @ 42.10/swu \$ 2,332.5
 " @ 84.20/ \$ 4,665

September 11, 1974



U. S. ATOMIC ENERGY COMMISSION

Revenue Estimates Related to Uranium Enrichment Services ^{1/}
(In Millions)

	FY 1976	FY 1977	FY 1978	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Uranium enrichment activity services	\$ 0.9	\$ 0.9	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0
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U. S. ATOMIC ENERGY COMMISSION

Revenue Estimates Related to Uranium Enrichment Services ^{1/}
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C. Hosmer

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1974-77 \$ 2 1/2 B.1

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September 11, 1974



GOVERNMENT ENRICHING COMPLEX

Twenty-Year Financial Summary

Plant Value - \$ 5 Billion
Inventory - \$ 1 Billion

27.8 Million S. W. U. capacity
plus 1 million centrifuges

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TWO ESSAYS ON ENRICHING URANIUM

by

Rep. Craig Hosmer (R-Calif.)

ESSAY #1: Bridging the Gap*



The United States has yet to make a reasoned, knowledgeable and long-range examination of where its national interests lie respecting the future structure of the uranium enrichment industry. Therefore, piecemeal efforts to move away from total governmental responsibility for enriching services, such as the recently announced Demonstration Centrifuge Enriching Facilities Program, are likely to fail for lack of proper economic and philosophical underpinnings.

Inquiry into these subjects was premature in the 1950's when the Atomic Energy Commission's enriching complex was completed, but operating at only a fraction of capacity because the invention of the H-bomb had drastically reduced requirements for enriched uranium for A-bombs. The emergence of a viable nuclear power industry during the 1960's drew attention to a future need for new enriching capacity for nuclear fuel purposes, but the need was not imminent. Sufficient for those times were planning the cascade improvement and uprating programs, plus a modest investment in preproduction of enriched uranium to somewhat delay the day when additional new capacity might be wanted.

By the start of the Nixon Administration in 1969 matters were coming into focus, but still not clearly. It was predictable that new enriching capacity would be needed by the mid-1980's or earlier. Due to technical and economic unknowns, it seemed that planning, promoting, financing and building of initial units might consume up to 10 years' lead time. That still left opportunities for study and decision making. Yet, with no more than an offhand look at the situation, Nixon's spokesman early and often announced a policy that "the next increment of enrichment capacity shall be supplied by private enterprise." The policy did not prove durable. It was not based on thoughtful study, knowledge and reasoned analysis. It ignored the need for a bridge to facilitate a transition from government enterprise to private enterprise. This omission was tacitly admitted during the Nixon Administration's final days when the Centrifuge Demonstration program was at last outlined to encourage industry by offering (without defining) some "assurance of supply" and some cash "assistance" to those who would enter the enriching game.

Unfortunately the scheme only nibbles at aiding and encouraging the construction of no more than six small centrifuge demonstration plants. AEC's hope seems to be that demonstration plants owners on their own will be able to expand their 100-300 ton demonstration facilities to an economic size of around 3 million annual separative work units** of capacity. AEC's plans for aid to private industry's gaseous diffusion plants are even more spartan, but no less ambiguous. To the Uranium Enrichment Associates who want to build a 9 million swu plant, no cash is offered, only a vague "assurance of supply" of separative work for UEA's customers in case the plant is delayed or fails to function at planned capacity. In either case, the Commission intends to recoup the cost of its aid by a suitable boost in charges for separative work.

*Essay #2: An Exercise in Aidsmanship will be distributed in a few days.

**Separative work is the effort needed to enrich uranium above its natural (.7%) ^U235 content for use as nuclear fuel. It is measured in arbitrarily defined units.

In addition, AEC would like to "normalize" the climate in which the uranium enrichment industry will operate by pricing its enriching services on a commercial scale rather than upon the current cost recovery basis.

Neither the Demonstration proposal nor the UEA proposal stems from a sound evaluation of the amount or kind of aid that might encourage enterprisers to build enriching plants or manufacturers to incur heavy front end costs for production lines to make components for them. AEC expects electric utilities to acknowledge their self interest in having a supply of nuclear fuel by paying a considerable premium for separative work out of demonstration plants from which full scale facilities would evolve. But the utilities are in a sorry business state. Additionally, they have little funds left for that kind of thing following AEC's recent passing of the hat for millions to carry forward its LMFBR demonstration program. AEC also expects the entrepreneurs and component manufacturers to put in something extra before it will discuss an amount of cash it would consider contributing to a centrifuge demonstration plant. But these people already have stretched themselves to the limit to make a decision to move forward. It seems unrealistic to expect them also to put something extra in the pot for the privilege of running technological and economic risks to pioneer a new industry. Moreover, cash assistance to the new industry may not really be what it most needs. Aid in the form of separative work could be infinitely more helpful.

Such details, and, in fact, the structuring of the uranium industry for the highest national interest, cannot be determined until a consensus obtains as to what that interest really is. Is it federal expansion of the existing governmental enriching complex to meet all future needs? Is it immediate and total transfer of the entire industry to private industry? Or, is it something between these extremes? Testimony given during the year-long, three-phase hearings of the Joint Committee on Atomic Energy rejected both extremes, but it failed to indicate clearly just where between them the national interest lies.

My own feeling is that it lies in deliberate movement toward a predominately private industry structure, but still retaining governmental responsibility for a few appropriate functions. For example, there is a continuing need for the state to control its sources of enriched material for nuclear weapons and naval reactors. Should this need dissipate, then government still must retain a lengthy responsibility to dispose of its huge enriched uranium stockpile in an orderly way, so as not to bankrupt private enrichers. There will be a growing demand for fully enriched uranium fuel for high temperature gas cooled reactors and precautions against diversion of this potential weapons material from peaceful hands indicates a need to keep its production as a government function. Government may also be needed to buffer the emerging private industry against risks of instant technological obsolescence from new isotope separation techniques such as laser developments. And, most certainly, government will be needed for some time to afford the help in the form of "assurance of supply" which even AEC finally has conceded is necessary for the emergence of private enrichment enterprises. Inquiry will also show government must be a factor to effectuate the "assistance" which AEC similarly concedes private industry should have for the transition.

The Commission has not revealed how much "assurance of supply" or how much cash "assistance" it will provide and, because it still operates under OMB's current policy of getting by on the cheap, it is unlikely to do so. Therefore, I offer my own estimates in order to begin quantifying these tasks.

Since it is unrealistic to expect beggarly assistance to six, small 100,000 to 300,000 swu centrifuge plants to suffice to get that industry on its feet, I will assume that "assurance of supply" is needed for all six plants on a full scale of 3 million swu's each, a total of 18 million swu's. The corresponding figure for UEA's diffusion plant is 9 million swu's.

Probably the worst that could happen to the UEA plant is a delay of 2 years, losing 18 million swu's production. But, since there is no more than a 50% chance for a delay of that length, it should be safe to "assure" against no more than a single year's loss of 9 million swu's. Less is known about centrifuge technology. Still, probably a two-year delay is the worst that could be expected, but the chance of getting it might move up to 75%. This indicates a need for, say, a 14 million swu stockpile to "assure supply" for customers of the six plants. According to these assumptions, UEA and the centrifuges together will require a 23 million swu preproduction stockpile for "assurance of supply" purposes. Add to that AEC's own need for a plant inventory of some 5 million swu's and a contingency stockpile of about 10 million swu's. Together AEC, UEA and the centrifuges will thus need a preproduction stockpile of 38 million swu's on hand by 1982, the date AEC has fixed for new capacity requirements. This is a physically attainable figure according to the AEC projections of its preproduction capabilities recently furnished JCAE.

However, attaining preproduction levels of that magnitude depend upon receipt of AEC's expected power deliveries and upon the availability of more feed material than currently anticipated. Boosting the stockpile above the 38 million swu figure in order to offer new private enriching enterprises really meaningful "assistance" in addition to "assurance of supply" would necessitate deliberately aggressive investments in both power and feed material. These are justified because aid in the form of preproduction can keep the new firms in business. It is much preferable to aid in the form of cash which only comforts their creditors. But AEC's present management is limited by annual budgets and a cautiously bureaucratic outlook. It is difficult to imagine AEC becoming aroused and inspired enough to take on an aggressive preproduction program of such size. Yet it is needed because the prosperity of the utility business and millions of people and businesses throughout the land who use electricity depends on adequate supplies of nuclear fuel. Such adequacy can be assured only by the success of the new enriching enterprises who would supply the new nuclear fuel demands. In turn, the success of these enterprises will depend heavily upon the existence of a sizeable enough preproduction stockpile to give them "assistance" during their early years in addition to affording the utilities "assurance of supply" of their nuclear fuel.

Thus it is apparent that very sound management and very certain financial procedures for the AEC's enriching complex must be insisted upon. Although sound management characterizes the AEC today, under several administrations sound management has not been a notable characteristic of the higher ups from whom AEC takes its orders. Even within AEC, as its business and burdens expand, the fragmentation of enrichment responsibility between loosely coordinated offices for part time attention could create difficulties.

But as serious as organization difficulties may be, they are small in comparison to AEC's problem of getting adequate funding for its enrichment activities via the annual budgeting, authorization and appropriations route. In the critical years between now and 1982, when aggressive programs for power and feed material

should be pursued, the entire system could be shattered by the stroke of some Budget Director's red pen. If it is, there will be no nuclear fuel and there will be no transition to private enriching enterprises.

Moreover, if the ERDA reorganization comes about and enriching activities are buried in a strange corner of this newborn bureaucracy, few people expect much more than disaster for the enrichment program.

All of which indicates a need to get uranium enrichment under certain controls and adequate financing procedures. So far no suggestion heard by the JCAE other than that for a United States Enrichment Corporation promises this accomplishment.

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NOTE: Essay #2 will reach you in a few days. It will be an exercise in aidmanship showing how, with certain control and adequate financing, it may be possible by 1982 to accumulate the desired stockpile of swu's to "assure supply," guarantee against other contingencies, "assist" private enrichers to become viable and profitable producers, recoup portions of the overseas market, and make a little money for Uncle Sam in the process.



TWO ESSAYS ON ENRICHING URANIUM
by

Rep. Craig Hosmer (R-Calif.)

ESSAY #2: An Exercise in Aidsmanship



This essay explores means to remove barriers to private industry assuming responsibility for new United States uranium enriching needs in 1982 and thereafter when the demand for nuclear fuel will begin to exceed AEC's ability to supply it.

One barrier is the chance that new enriching plants will be delayed coming on line or fail to operate at expected capacities. Utilities cannot risk being without needed nuclear fuel. Nor can plant owners risk being without revenues they need to pay back creditors and investors. In fact, they cannot finance their plants until this risk is removed. An impasse between the two has been created by the plant owners' effort to shift the risk by proposing a contract requiring utilities to pay whether or not they get their separative work.

Until enough new enriching plants are built to resolve the technological and economic unknowns underlying this impasse, a program should be adopted to lift these risks from utilities and plant owners alike. This can be done easily by accumulating a suitable stockpile of preproduced enriched uranium from AEC enriching plants which will otherwise be operating at less than capacity until around the end of 1982.

A second private enterprise barrier, peculiar to the centrifuges, is the heavy front end cost involved in setting up a new industry. It will fall on plant owners directly and indirectly via front end costs for putting in new production lines that component suppliers will be passing upward. To win the objective of bringing such plants into being under private sponsorship, reasonable cash "assistance" to overcome this hurdle is worthwhile. This "assistance" also can be readily managed, along with the program for "assurance of supply".

Assurance of Supply

The 9 million swu diffusion plant proposed by Uranium Enrichment Associates ought to dispel the engineering and economic unknowns for that technology. For the centrifuges, it is safe to assume that six 3 million swu plants will do the same job. AEC will be supporting its own 15 million swu stockpile for flywheel and contingency purposes. With the probable availability of that in mind during an emergency, pre-production of 27 million swu's, a year's planned production of the seven new private plants, seems ample to "assure" the fuel supply of customers and revenues of owners of new plants running into trouble. (It is 4 million swu's over the amount assumed for this purpose in Essay #1.) The risk of total failure of these plants is not regarded as likely and not here "assured" against. That magnitude of failure would have national consequences calling for prompt Federal intervention with a mini-Manhattan Project.

Exercise A (pages 3-4) is based on one of AEC's alternate operating plans. It is well within the physical capabilities of its complex. The Exercise shows that a 27 million swu "assurance of supply" stockpile can be built up and worked off for a surcharge to AEC customers of less than \$1/swu. But to do so demands quick and decisive adoption of an "assurance" program and, from beginning to end, its aggressive operation and zealous financing. Only with these characteristics can such a program create and maintain credible "assurance of supply". These characteristics do not mark AEC's present decision making mechanisms and financing resources. Prompt restructuring of the government's enriching activities to incorporate them is essential

Assistance

Exercise B (pages 5-6) is based on an AEC operating plan which preproduces an extra 12.4 million swu, change tails assays and buy 21,000 short tons of added natural uranium feed. The new centrifuge plants would get preproduction at its cost of about \$56/swu and allowed to market it at the commercial price, say \$80/swu, thus being "assisted" by the \$24 differential. Against an approximate \$1 billion investment for a 3 million swu plant, the scheme nets less than \$54 million in "assistance" It is no bargain.

The most efficient way to raise money to "assist" these new plants is by the straightforward addition of a surcharge to AEC sales. Over the 1975-1987 operating period of my hypothetical "Assurance of Supply"/"Assistance" Program, AEC will perform about 285 million swu's of enriching services. The "assistance" value to each of the six new plants of a \$1.00 boost in swu charge is \$47.5 million, calculated as follows:

$$285 \times \$1 = \frac{\$285}{6} = \$47.50$$

Thus, a \$5 surcharge will garner \$237.5 million in aid for each new plant, a sum likely to far exceed all the conceivable front end costs of getting this new industry on its feet.

The Real World
based on assumptions.

Exercises A and B are only hypotheses. In the real world, actual circumstances such as these must be dealt with:

- o We must stop thinking in terms of "AEC" and start thinking in terms of "the government" as it may be ERDA or USEC or another authority which soon takes over responsibility for U.S. enriching activities and stockpiles.
- o Scuttling the government's split-tails operation is inevitable and the sooner the better for the "assurance" program and the health of the mining, milling and conversion link of the nuclear fuel chain.
- o The government probably can find legal ways to boost its swu charges toward commercial levels. It's a good idea to start moving nearer to reality and away from extant Alice-in-Wonderland swu pricing criteria.
- o Exercise A shows that AEC Plant 3 1/2 is not needed. Accordingly, I am dropping authority for any new government enriching capacity from USEC.
- o USEC, now better than ever, is still the only game in town effecting the restructure of government enriching activities requisite for a credible "assurance of supply" program.

Other realities also must be coped with, such as the fact that utilities are slowing down their nuclear programs. By 1982, in relation to what they have contracted for, there is a likely delay in nuclear fuel demand aggregating 30 to 40 million swu's of separative work. Dealing with the responsibilities and seizing the opportunities presented by that, and any other unexpected nuclear fuel developments seem quite beyond the present AEC's room for maneuvering.

Utilities bound to contracts for the delayed separative work will be hard pressed to take and pay for it on schedule, only to bear added carrying charges until they start using it. A scheme to somewhat relieve their burden could be built around the government picking up this excess for stockpile purposes in lieu of otherwise preproducing part or all of the "assurance" stockpile. These swu's would come at the regular \$50 production cost rather than (text continues at page 7)

EXERCISE A

("Assurance of Supply" 27 million swu)

	<u>Preproduction 10⁶ swu</u>	<u>Incremental Cost @ \$30 10⁶ \$</u>	<u>10%/Yr Carry- ing Charge 8 Yrs to 1 Yr</u>
1975	5.1	153	122.4
1976	7.1	213	149.1
1977	2.7	81	48.6
1978	4.8	144	72
1979	3.2	96	38.4
1980	1.5	45	13.5
1981	1.1	32	6.6
1982	1.5	45	4.5
Totals	27.0	809	455.1

This preproduction stockpile of 27 million swu's cost \$1265.1 million by the end of year 1982 (\$810 for enriching and \$455.1 for carrying charges).

The scheme for working off this stockpile is based on EEI's estimate that UEA's 9 million swu plant will handle load growth for 1 1/2 years after 1982 and that thereafter the new capacity requirement will average 6 million swu's annually.

This means that the 9 million swu's accumulated for "assurance of supply" for the UEA plant will, in 1983, go either physically to UEA's utility customers if the plant fails to get on line, or if it succeeds, AEC ~~would~~ will reduce its 1983 production by 9 million swu's to effect the cutback. The 18 million swu's accumulated to "assure supply" for customers of the 6 centrifuge plants ~~would~~ will be worked off as these plants are assumed to coming on line to meet load growth, i.e. 3 million swu in 1983, 6 million each in 1984 and 1985, and the final 3 million in 1986.



(Exercise A - continued)

Thereupon the total cost of this "assurance of supply" program may be calculated as follows:

	<u>Stockpile Size in 10⁶ swu's</u>	<u>Year's Carrying Charge 10%</u>
1983	18	84.4
1984	15	70.1
1985	9	42.2
1986	3	14.1
1987	--	---
Investment Through 1982	--	<u>1265.1</u>
Total		\$1475.9

AEC's 1975 - 1982 Separative Work Production

<u>Units</u>	<u>Investment</u>	<u>Avg./swu</u>
126.7 for customers	\$6335	\$50.000000
<u>27</u> for preproduction	<u>1475.9</u>	54.662962
153.7 total	\$7810.9	\$50.819128

*Surcharge
for operating
the stockpile*

NOTES:

(1) Exercise A is based on AEC's alternative operating Plan 2 in Table 3 appended to George F. Quinn's testimony submitted to JCAE June 25, 1974, except that it requires 1.5 million swu preproduction in 1982 vice .4 million.

(2) The cumulative stockpile achieved in 1982 by all AEC preproduction is 42 million swu's of which, in this Exercise, 27 million is allocated to "assurance of supply" and 15 million to AEC's own purposes, i.e., 5 million flywheel and 10 million for contingencies. The carrying charge for this 15 million is included in the assumed \$50/swu charge to AEC's regular customers.

(3) The assumed cost of \$50/swu for regular production is arbitrary and the \$30/swu incremental cost for preproduction is based on \$2.50 for labor and \$27.50 for power @ 11 mills. Any 1 mill change in power cost effects about a \$2.50 change in swu cost.



EXERCISE B

("Assurance of Supply" 27 million swu - "Assistance" 12.4 million swu)

	<u>Preproduction 10⁶ swu</u>	<u>Cost @ \$30 (10⁶ \$)</u>	<u>10%/Yr Carry- ing Charge 8 Yrs to 1 Yr</u>	<u>Feed & Con- version 10⁶ (Short Tons)</u>	<u>Cost @ \$20/1b</u>	<u>10%/Yr Carry- ing Charge 7 Yrs to 1 Yr</u>
1975	6.4	192	153.6	---	---	---
1976	7.1	213	149.1	1.5	60	42
1977	4.5	135	81	7.5	300	180
1978	6.8	204	102	11.2	448	224
1979	5.7	171	68.4	8.3	332	132.8
1980	3.7	111	33.3	5.1	204	61.2
1981	3.5	105	21	4.1	164	32.8
1982	1.7	51	5.1	.8	32	3.2
Totals	39.4	1182	613.5	38.5	1540	676

This preproduction stockpile of 39.4 million swu's cost \$2471.5 million by the end of 1982 (for enriching \$1182, for carrying charge on enriching \$613.5, and for carrying charges on feed purchases \$676. The cost of feed is not included in the total since this exercise is solely for the purpose of determining swu costs. Feed cost -- equivalent to \$39.086284 for each swu -- would be recovered from customers at the time enriched uranium is delivered.)

The scheme for working off this stockpile is based on EEI's estimate that UEA's 9 million swu plant will handle load growth for 1 1/2 years after 1982 and that thereafter the new capacity requirement will average 6 million swu's annually.

This means that the 9 million swu's accumulated for "assurance of supply" for the UEA plant will, in 1983, go either physically to UEA's utility customers if the plant fails to get on line, or if it succeeds, AEC would reduce its 1983 production by 9 million swu's to effect the cutback. The 18 million swu's accumulated to "assure supply" for customers of the 6 centrifuge plants would be worked off as these plants are assumed to coming on line to meet load growth, i.e. 3 million swu in 1983, 6 million each in 1984 and 1985, and the final 3 million in 1986.

It is arbitrarily assumed that the 12.4 swu's accumulated to "assist" the centrifuge entrepreneurs will be worked down as follows: .4 in 1982, and 3 million during each of the years 1983, 1984, 1986 and 1987.

Thus the 5 year campaign to dispose of the combined "assurance of supply" and "assistance" stockpiles would be as follows: 9.4 million in 1983, 6 million in 1984, 9 million each in 1985 and 1986, and 3 million in 1987. Total: 39.4 million.



(Exercise B - continued)

Thereupon the total cost of the "assurance" and "assistance" programs may be calculated as follows:

	<u>Stockpile Size in 10⁶ swu's</u>	<u>Year's Carrying Charge 10%</u>
1983	30	188.2
1984	24	150.5
1985	15	94.1
1986	6	37.7
1987	--	--
Investment Through 1982		<u>2471.5</u>
Total.		\$2942

AEC's 1975 - 1982 Separative Work Production

<u>Units</u>	<u>Investment</u>	<u>Avg./swu</u>
126.7 for customers	\$6335	\$50.000000
<u>39.4</u> for preproduction	<u>2942</u>	<u>74.670050</u>
166.1 total	\$9277	\$55.851896

NOTES:

(1) Exercise B is based on AEC's alternative operating Plan 1A in Table 5 appended to George F. Quinn's testimony submitted to JCAE June 25, 1974.

(2) See notes (2) and (3) to Exercise A for explanations of AEC's responsibility for 15 million swu's of the stockpile and assumptions re swu costs. The assumed average feed and conversion cost equivalent to \$20/lb U₃O₈ is a best guess.



the \$30 incremental cost. Another consideration is that the government's complex must have feed to work on and the utilities will have to deliver it according to contract schedules, irrespective of their delayed need for separative work.

How would the \$30/\$50 swu differential be fairly adjusted? How should the utilities' burden for carrying charges on the feed be eased, if at all?

These, and a host of other unknowns that the future will reveal, will have to be resolved by whoever is in charge of the U.S. government's enriching activities. This must be done aggressively in a financially responsible manner, promptly, skillfully, intelligently, flexibly, effectively, and always with the overall national interest foremost in mind.

All of which serves to emphasize what was earlier written, to wit: "USEC ... is still the only game in town effecting the restructure of government enriching activities requisite for a credible "assurance of supply" program."



THE WHITE HOUSE

ACTION

WASHINGTON

November 5, 1974

MEETING WITH REP. CRAIG HOSMER (R-CAL)

2:00 - 2:15 p.m. (15 minutes)

Wednesday, November 6, 1974

The Oval Office

From: William E. Timmons *BT*

I. PURPOSE

To allow Hosmer to discuss his views on atomic energy programs.

II. BACKGROUND, PARTICIPANTS AND PRESS PLAN

A. Background:

1. Hosmer is retiring from Congress after his term this year. He has been a good supporter of the Administration, is ranking GOP on House Interior Committee and has a reputation of being an expert on atomic energy matters (he also serves on the Joint Atomic Energy Committee).
2. Craig requested the meeting to discuss uranium enrichment and the "future structure" of this industry. He is believed to be interested in heading up a quasi government organization (like TVA) which would produce atomic energy.

B. Participants:

The President, Rep. Hosmer and Frank Zarb (OMB).

C. Press Plan:

The meeting to be announced by the Press Office.
White House photographer only.



III. TALKING POINTS

The paper in tab A was prepared by OMB and coordinated with Domestic Council.



Background:

AEC plants have reached their capacity to enrich uranium fuel for nuclear power plants and are no longer taking orders from domestic and foreign companies. (We believe, however, that we will be able to meet all foreign and domestic needs through 1982.) In 1971, the former Administration embarked on a policy of encouraging private industry to undertake uranium enrichment.

Industry has attempted to enter this field and one company (Bechtel) is ready to commit to build a \$2.8 billion plant if it can get enough orders, but it is running into trouble. Part of the problem lies in Bechtel's extreme contracting terms, however, a problem is also posed by potential AEC competition if the government further increases its uranium enriching capacity beyond its current commitment. The electric utilities are unlikely to make commitments to private companies as long as there is any chance of getting a cheaper product from the government.

Craig Hosmer has introduced a bill which would create a government corporation to operate existing AEC plants and provide limited assistance to private industry to build new plants.

There are serious problems with this approach:

- o Treasury objects to the financing feature which would allow this government corporation to compete in the money markets.
- o Such a bill would likely be amended to enable the corporation to build new plants and this would certainly be the death blow to the private company initiatives.
- o If the government corporation were excluded from the money market there is a potential for a very large outlay impact on the federal budget in the beginning years, however, we will at the same time be realizing increased income from the existing three plants.

Talking Points

- o You are recognized as a leading authority on uranium enrichment and I am anxious to hear your views on this important subject.
- o I generally favor a policy of encouraging private industry to provide additional enrichment capacity. However, you raise some good points. As you know, this is under intensive review by AEC, NSC (impact on foreign requirements) and others (OMB). I expect to ultimately review these studies prior to any federal decision.
- o This subject will fall within ERDA's jurisdiction under the legislation I signed last month. I hope Bob Seamans is confirmed and gets on board in time to review the enrichment question and provide me with his recommendation.

STAFFING



THE WHITE HOUSE

ACTION MEMORANDUM

WASHINGTON

LOG NO.:

Date: December 18, 1974

Time:

FOR ACTION: Ken Cole *JK*
Brent Scowcroft *JK*
Bill Timmons *JK*
Roland Elliott *JK*

cc (for information):

FROM THE STAFF SECRETARY

DUE: Date: Friday, December 20, 1974

Time: cob

SUBJECT:

Ash memo (12/17/74) re: Rep. Hosmer's papers on uranium enrichment

ACTION REQUESTED:

For Necessary Action

For Your Recommendations

Prepare Agenda and Brief

Draft Reply

For Your Comments

Draft Remarks

REMARKS:

(use)
12/19 Elliott - ok
RE - changes



PLEASE ATTACH THIS COPY TO MATERIAL SUBMITTED.

If you have any questions or if you anticipate a delay in submitting the required material, please telephone the Staff Secretary immediately.

Jerry H. Jones
Staff Secretary

THE WHITE HOUSE
WASHINGTON

December 20, 1974

MEMORANDUM FOR: WARREN HENDRIKS
FROM: MAX L. FRIEDERSDORF *M-G.*
SUBJECT: Action Memorandum - Log No.
Ash memo (12/17/74) re: Rep. Hosmer's
papers on uranium enrichment.

The Office of Legislative Affairs concurs in the attached proposal
and has no additional recommendations.

Attachment



THE WHITE HOUSE

ACTION MEMORANDUM

WASHINGTON

LOG NO.:

Date: December 18, 1974

Time:

FOR ACTION: Ken Cole
Brent Scowcroft
✓ Bill Timmons
Roland Elliott

cc (for information):

FROM THE STAFF SECRETARY

DUE: Date: Friday, December 20, 1974

Time: cob

SUBJECT:

Ash memo (12/17/74) re: Rep. Hosmer's papers on uranium enrichment

ACTION REQUESTED:

___ For Necessary Action

X For Your Recommendations

___ Prepare Agenda and Brief

___ Draft Reply

X For Your Comments

___ Draft Remarks

REMARKS:

PLEASE ATTACH THIS COPY TO MATERIAL SUBMITTED.

If you have any questions or if you anticipate a delay in submitting the required material, please telephone the Staff Secretary immediately.

Jerry H. Jones
Staff Secretary



Glenn

THE WHITE HOUSE

ACTION MEMORANDUM

WASHINGTON

LOG NO.:

Date: December 18, 1974

Time:

FOR ACTION: Ken Cole
Brent Scowcroft
Bill Timmons
Roland Elliott

cc (for information):

FROM THE STAFF SECRETARY

DUE: Date: Friday, December 20, 1974

Time: cob

SUBJECT:

Ash memo (12/17/74) re: Rep. Hosmer's papers on uranium enrichment

ACTION REQUESTED:

For Necessary Action

For Your Recommendations

Prepare Agenda and Brief

Draft Reply

For Your Comments

Draft Remarks

REMARKS:

JK O



PLEASE ATTACH THIS COPY TO MATERIAL SUBMITTED.

If you have any questions or if you anticipate a delay in submitting the required material, please telephone the Staff Secretary immediately.

Jerry H. Jones:
Staff Secretary

THE WHITE HOUSE

WASHINGTON

Dear Craig:

I want to thank you again for the information on the uranium enrichment problem which you provided me several weeks ago. I have referred it to those actively involved with this matter, and they will give it full consideration.

I know that you will soon retire from the Congress. ^(In my judgment,) You have ~~in my~~ ^{particular, in the area resulting} judgment rendered a very great public service, ~~including~~ ^{conspicuously} that ~~stemming~~ from your extensive and perceptive understanding of the intricacies of uranium enrichment. ~~I think~~ You have done much to advance the objective of participation by private enterprise in the future of this important segment of our national energy complex, and you have thrown much light on the problems involved and on alternative ways of proceeding.

It has always been a pleasure to work with you, and I wish you everything good in your future activities.

Sincerely,

Honorable Craig Hosmer
House of Representatives
Washington, D. C. 20515

THE WHITE HOUSE

ACTION MEMORANDUM

WASHINGTON

LOG NO.: 6224

Date: December 18, 1974

Time:

FOR ACTION: Ken Cole
Brent Scowcroft
Bill Timmons
Roland Elliott

cc (for information):

FROM THE STAFF SECRETARY

DUE: Date: Friday, December 20, 1974

Time: cob

SUBJECT:

Ash memo (12/17/74) re: Rep. Hosmer's papers on uranium enrichment

ACTION REQUESTED:

___ For Necessary Action

X For Your Recommendations

___ Prepare Agenda and Brief

___ Draft Reply

X For Your Comments

___ Draft Remarks

REMARKS:

PLEASE ATTACH THIS COPY TO MATERIAL SUBMITTED.

If you have any questions or if you anticipate a delay in submitting the required material, please telephone the Staff Secretary immediately.

Jerry H. Jones
Staff Secretary

RECEIVED
JAN 6 1975
CENTRAL FILES

THE WHITE HOUSE
WASHINGTON

DEC 17 1974

ACTION

MEMORANDUM FOR THE PRESIDENT

FROM: ~~ROY J. ASH~~

Subject: Rep. Hosmer's papers on uranium enrichment

This is in response to your note to me, attached to some papers on uranium enrichment recently left with you by Rep. Craig Hosmer, with the notation "What should I do about this?" The papers comprise a) two pages of tabular analysis and b) copies of Hosmer's two recent "essays" on uranium enrichment.

The essential message of the tabular analysis is roughly as follows: "If AEC's uranium enrichment charge to industry is raised to commercial levels, the revenues received over the next 20 years will be sufficient to cover all costs, repay the Treasury for the capital value of its plants, and facilitate creation of a private enrichment industry in the U.S.

Based on our discussion with AEC, Rep. Hosmer's analysis appears to be generally valid over the long term. The draft legislation to enable AEC to raise its charges is nearly ready for transmission to the Congress.

Rep. Hosmer's two "essays" in essence argue that private entry into the uranium enrichment business can succeed only if AEC/ERDA preproduces, over the next 4-8 years, a sufficiently large stockpile of enriched uranium, at considerable cost, to "backstop" the fledgling private firms. We are very much aware of this need.

The Joint Committee on Atomic Energy has recently completed hearings on Rep. Hosmer's bill (H.R. 17418) to create a Government corporation to take over the operation of the AEC plants and to facilitate private entry. The Hosmer bill and the hearing record will apparently be left as a kind of legacy to the 94th Congress.

At NSC's request, there is now in preparation NSSM 209, which will refine and re-evaluate the options for providing future increments of uranium enrichment capacity.

Attached for your signature is a suggested letter to Rep. Hosmer to thank him for the information he provided you.

Attachment



THE WHITE HOUSE

WASHINGTON

Dear Craig:

I want to thank you again for the information on the uranium enrichment problem which you provided me several weeks ago. I have referred it to those actively involved with this matter, and they will give it full consideration.

I know that you will soon retire from the Congress. You have in my judgment rendered a very great public service, including conspicuously that stemming from your extensive and perceptive understanding of the intricacies of uranium enrichment. I think you have done much to advance the objective of participation by private enterprise in the future of this important segment of our national energy complex, and you have thrown much light on the problems involved and on alternative ways of proceeding.

It has always been a pleasure to work with you, and I wish you everything good in your future activities.

Sincerely,

Honorable Craig Hosmer
House of Representatives
Washington, D. C. 20515

C. HOSMER

GOVERNMENT ENRICHING COMPLEX

Twenty-Year Financial Summary

Plant Value - \$ 5 Billion
Inventory - \$ 1 Billion

27.8 Million S. W. U. capacity
plus 1 million centrifuges

Total Revenues @ \$70/swu 36,001,000,000

Operating Costs

Power @ 10 mills.	12,202,000,000
Labor	1,525,000,000
Misc. R&D	1,525,000,000
In lieu State taxes	<u>1,028,600,000</u>

16,280,600,000

Payments to U. S.

Royalty @ \$3/swu	1,542,900,000
In lieu Inc. Tax @ \$6/swu	3,050,200,000
Interest & Amortization	<u>13,577,700,000</u>

(8%)

✓ 18,170,800,000

Subtotal 34,451,400,000

Net Income (To finance CIP/CUP @ \$1 Billion and
subsidize front end costs of U.S. Centrifuge en-
riching industry): 1,550,600,000

C. Hoerner

U. S. ATOMIC ENERGY COMMISSION

Revenue Estimates Related to Uranium Enrichment Services ^{1/}
(In Millions)

	<u>FY 1976</u>	<u>FY 1977</u>	<u>FY 1978</u>	<u>FY 1979</u>	<u>FY 1980</u>	<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>
Uranium enrichment activity services	\$ 0.9	\$ 0.9	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0	\$ 1.0
Losses, consumption, etc.	25.2	24.8	24.3	23.9	23.5	23.2	22.8	22.4	22.0	21.7
Uranium enrichment services										
Toll enriching	446.4	714.9	764.9	1,076.8	1,376.6	1,733.5	1,793.2	1,854.8	2,089.6	2,309.8
Advance Payments on New Enrichment Contracts	190.3	11.6	-41.9	-99.9	-117.7	-170.8	-162.1	-1.4	-	-
Subtotal Uranium Enrichment Services	<u>636.7</u>	<u>726.5</u>	<u>723.0</u>	<u>976.9</u>	<u>1,258.9</u>	<u>1,562.7</u>	<u>1,631.1</u>	<u>1,853.4</u>	<u>2,089.6</u>	<u>2,309.8</u>
Total Revenues Related to Uranium Enrichment Services	<u>\$ 662.8</u>	<u>\$ 752.2</u>	<u>\$ 748.3</u>	<u>\$1,001.8</u>	<u>\$1,283.4</u>	<u>\$1,586.9</u>	<u>\$1,654.9</u>	<u>\$1,876.8</u>	<u>\$2,112.6</u>	<u>\$2,332.5</u>

The revenue estimates assume that customers holding requirements contracts will convert to long-term fixed commitment contracts prior to FY 1976. The estimates are based on the recently announced price increase to \$42.10 per SWU for long-term fixed commitment contracts and the changes per SWU have been increased at a rate of 2% semiannually in accordance with the revised pricing schedule. Sales of SWU's are estimated on the basis of deliveries under contracts and assume contracting to a sustaining capacity of 320,000 MW(e) pending decision on plutonium recycle. The sales projection for any given year is subject to adjustment depending upon the actual status of power reactor construction and/or operations.

Downpayments:	<u>FY 1974</u>	<u>FY 1975</u>	<u>FY 1976</u>	<u>FY 1977</u>	TOTALS
Domestic	\$ 139.5	162.6	158.9	24.2	485.2
Foreign	<u>41.8</u>	<u>65.3</u>	<u>55.7</u>	<u>21.5</u>	<u>184.3</u> (27.5%)
Total	181.3	227.7	214.6	45.7	<u>669.5</u>

74-77 \$ 2/3 Bil

Revenue @ 42.10/swu \$ 2,332.5
 " @ 84.20/ \$ 4,665

TWO ESSAYS ON ENRICHING URANIUM
by
Rep. Craig Hosmer (R-Calif.)

ESSAY #1: Bridging the Gap*

The United States has yet to make a reasoned, knowledgeable and long-range examination of where its national interests lie respecting the future structure of the uranium enrichment industry. Therefore, piecemeal efforts to move away from total governmental responsibility for enriching services, such as the recently announced Demonstration Centrifuge Enriching Facilities Program, are likely to fail for lack of proper economic and philosophical underpinnings.

Inquiry into these subjects was premature in the 1950's when the Atomic Energy Commission's enriching complex was completed, but operating at only a fraction of capacity because the invention of the H-bomb had drastically reduced requirements for enriched uranium for A-bombs. The emergence of a viable nuclear power industry during the 1960's drew attention to a future need for new enriching capacity for nuclear fuel purposes, but the need was not imminent. Sufficient for those times were planning the cascade improvement and uprating programs, plus a modest investment in preproduction of enriched uranium to somewhat delay the day when additional new capacity might be wanted.

By the start of the Nixon Administration in 1969 matters were coming into focus, but still not clearly. It was predictable that new enriching capacity would be needed by the mid-1980's or earlier. Due to technical and economic unknowns, it seemed that planning, promoting, financing and building of initial units might consume up to 10 years' lead time. That still left opportunities for study and decision making. Yet, with no more than an offhand look at the situation, Nixon's spokesman early and often announced a policy that "the next increment of enrichment capacity shall be supplied by private enterprise." The policy did not prove durable. It was not based on thoughtful study, knowledge and reasoned analysis. It ignored the need for a bridge to facilitate a transition from government enterprise to private enterprise. This omission was tacitly admitted during the Nixon Administration's final days when the Centrifuge Demonstration program was at last outlined to encourage industry by offering (without defining) some "assurance of supply" and some cash "assistance" to those who would enter the enriching game.

Unfortunately the scheme only nibbles at aiding and encouraging the construction of no more than six small centrifuge demonstration plants. AEC's hope seems to be that demonstration plants owners on their own will be able to expand their 100-300 ton demonstration facilities to an economic size of around 3 million annual separative work units** of capacity. AEC's plans for aid to private industry's gaseous diffusion plants are even more spartan, but no less ambiguous. To the Uranium Enrichment Associates who want to build a 9 million swu plant, no cash is offered, only a vague "assurance of supply" of separative work for UEA's customers in case the plant is delayed or fails to function at planned capacity. In either case, the Commission intends to recoup the cost of its aid by a suitable boost in charges for separative work.

*Essay #2: An Exercise in Aidsmanship will be distributed in a few days.

**Separative work is the effort needed to enrich uranium above its natural (.7%) ^U235 content for use as nuclear fuel. It is measured in arbitrarily defined units.

In addition, AEC would like to "normalize" the climate in which the uranium enrichment industry will operate by pricing its enriching services on a commercial scale rather than upon the current cost recovery basis.

Neither the Demonstration proposal nor the UEA proposal stems from a sound evaluation of the amount or kind of aid that might encourage enterprisers to build enriching plants or manufacturers to incur heavy front end costs for production lines to make components for them. AEC expects electric utilities to acknowledge their self interest in having a supply of nuclear fuel by paying a considerable premium for separative work out of demonstration plants from which full scale facilities would evolve. But the utilities are in a sorry business state. Additionally, they have little funds left for that kind of thing following AEC's recent passing of the hat for millions to carry forward its LMFBR demonstration program. AEC also expects the entrepreneurs and component manufacturers to put in something extra before it will discuss an amount of cash it would consider contributing to a centrifuge demonstration plant. But these people already have stretched themselves to the limit to make a decision to move forward. It seems unrealistic to expect them also to put something extra in the pot for the privilege of running technological and economic risks to pioneer a new industry. Moreover, cash assistance to the new industry may not really be what it most needs. Aid in the form of separative work could be infinitely more helpful.

Such details, and, in fact, the structuring of the uranium industry for the highest national interest, cannot be determined until a consensus obtains as to what that interest really is. Is it federal expansion of the existing governmental enriching complex to meet all future needs? Is it immediate and total transfer of the entire industry to private industry? Or, is it something between these extremes? Testimony given during the year-long, three-phase hearings of the Joint Committee on Atomic Energy rejected both extremes, but it failed to indicate clearly just where between them the national interest lies.

My own feeling is that it lies in deliberate movement toward a predominately private industry structure, but still retaining governmental responsibility for a few appropriate functions. For example, there is a continuing need for the state to control its sources of enriched material for nuclear weapons and naval reactors. Should this need dissipate, then government still must retain a lengthy responsibility to dispose of its huge enriched uranium stockpile in an orderly way, so as not to bankrupt private enrichers. There will be a growing demand for fully enriched uranium fuel for high temperature gas cooled reactors and precautions against diversion of this potential weapons material from peaceful hands indicates a need to keep its production as a government function. Government may also be needed to buffer the emerging private industry against risks of instant technological obsolescence from new isotope separation techniques such as laser developments. And, most certainly, government will be needed for some time to afford the help in the form of "assurance of supply" which even AEC finally has conceded is necessary for the emergence of private enrichment enterprises. Inquiry will also show government must be a factor to effectuate the "assistance" which AEC similarly concedes private industry should have for the transition.

The Commission has not revealed how much "assurance of supply" or how much cash "assistance" it will provide and, because it still operates under OMB's current policy of getting by on the cheap, it is unlikely to do so. Therefore, I offer my own estimates in order to begin quantifying these tasks.

Since it is unrealistic to expect beggarly assistance to six, small 100,000 to 300,000 swu centrifuge plants to suffice to get that industry on its feet, I will assume that "assurance of supply" is needed for all six plants on a full scale of 3 million swu's each, a total of 18 million swu's. The corresponding figure for UEA's diffusion plant is 9 million swu's.

Probably the worst that could happen to the UEA plant is a delay of 2 years, losing 18 million swu's production. But, since there is no more than a 50% chance for a delay of that length, it should be safe to "assure" against no more than a single year's loss of 9 million swu's. Less is known about centrifuge technology. Still, probably a two-year delay is the worst that could be expected, but the chance of getting it might move up to 75%. This indicates a need for, say, a 14 million swu stockpile to "assure supply" for customers of the six plants. According to these assumptions, UEA and the centrifuges together will require a 23 million swu preproduction stockpile for "assurance of supply" purposes. Add to that AEC's own need for a plant inventory of some 5 million swu's and a contingency stockpile of about 10 million swu's. Together AEC, UEA and the centrifuges will thus need a preproduction stockpile of 38 million swu's on hand by 1982, the date AEC has fixed for new capacity requirements. This is a physically attainable figure according to the AEC projections of its preproduction capabilities recently furnished JCAE.

However, attaining preproduction levels of that magnitude depend upon receipt of AEC's expected power deliveries and upon the availability of more feed material than currently anticipated. Boosting the stockpile above the 38 million swu figure in order to offer new private enriching enterprises really meaningful "assistance" in addition to "assurance of supply" would necessitate deliberately aggressive investments in both power and feed material. These are justified because aid in the form of preproduction can keep the new firms in business. It is much preferable to aid in the form of cash which only comforts their creditors. But AEC's present management is limited by annual budgets and a cautiously bureaucratic outlook. It is difficult to imagine AEC becoming aroused and inspired enough to take on an aggressive preproduction program of such size. Yet it is needed because the prosperity of the utility business and millions of people and businesses throughout the land who use electricity depends on adequate supplies of nuclear fuel. Such adequacy can be assured only by the success of the new enriching enterprises who would supply the new nuclear fuel demands. In turn, the success of these enterprises will depend heavily upon the existence of a sizeable enough preproduction stockpile to give them "assistance" during their early years in addition to affording the utilities "assurance of supply" of their nuclear fuel.

Thus it is apparent that very sound management and very certain financial procedures for the AEC's enriching complex must be insisted upon. Although sound management characterizes the AEC today, under several administrations sound management has not been a notable characteristic of the higher ups from whom AEC takes its orders. Even within AEC, as its business and burdens expand, the fragmentation of enrichment responsibility between loosely coordinated offices for part time attention could create difficulties.

But as serious as organization difficulties may be, they are small in comparison to AEC's problem of getting adequate funding for its enrichment activities via the annual budgeting, authorization and appropriations route. In the critical years between now and 1982, when aggressive programs for power and feed material

should be pursued, the entire system could be shattered by the stroke of some Budget Director's red pen. If it is, there will be no nuclear fuel and there will be no transition to private enriching enterprises.

Moreover, if the ERDA reorganization comes about and enriching activities are buried in a strange corner of this newborn bureaucracy, few people expect much more than disaster for the enrichment program.

All of which indicates a need to get uranium enrichment under certain controls and adequate financing procedures. So far no suggestion heard by the JCAE other than that for a United States Enrichment Corporation promises this accomplishment.

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NOTE: Essay #2 will reach you in a few days. It will be an exercise in aidmanship showing how, with certain control and adequate financing, it may be possible by 1982 to accumulate the desired stockpile of swu's to "assure supply," guarantee against other contingencies, "assist" private enrichers to become viable and profitable producers, recoup portions of the overseas market, and make a little money for Uncle Sam in the process.

TWO ESSAYS ON ENRICHING URANIUM
by

Rep. Craig Hosmer (R-Calif.)

ESSAY #2: An Exercise in Aidsmanship

This essay explores means to remove barriers to private industry assuming responsibility for new United States uranium enriching needs in 1982 and thereafter when the demand for nuclear fuel will begin to exceed AEC's ability to supply it.

One barrier is the chance that new enriching plants will be delayed coming on line or fail to operate at expected capacities. Utilities cannot risk being without needed nuclear fuel. Nor can plant owners risk being without revenues they need to pay back creditors and investors. In fact, they cannot finance their plants until this risk is removed. An impasse between the two has been created by the plant owners' effort to shift the risk by proposing a contract requiring utilities to pay whether or not they get their separative work.

Until enough new enriching plants are built to resolve the technological and economic unknowns underlying this impasse, a program should be adopted to lift these risks from utilities and plant owners alike. This can be done easily by accumulating a suitable stockpile of preproduced enriched uranium from AEC enriching plants which will otherwise be operating at less than capacity until around the end of 1982.

A second private enterprise barrier, peculiar to the centrifuges, is the heavy front end cost involved in setting up a new industry. It will fall on plant owners directly and indirectly via front end costs for putting in new production lines that component suppliers will be passing upward. To win the objective of bringing such plants into being under private sponsorship, reasonable cash "assistance" to overcome this hurdle is worthwhile. This "assistance" also can be readily managed, along with the program for "assurance of supply".

Assurance of Supply

The 9 million swu diffusion plant proposed by Uranium Enrichment Associates ought to dispel the engineering and economic unknowns for that technology. For the centrifuges, it is safe to assume that six 3 million swu plants will do the same job. AEC will be supporting its own 15 million swu stockpile for flywheel and contingency purposes. With the probable availability of that in mind during an emergency, preproduction of 27 million swu's, a year's planned production of the seven new private plants, seems ample to "assure" the fuel supply of customers and revenues of owners of new plants running into trouble. (It is 4 million swu's over the amount assumed for this purpose in Essay #1.) The risk of total failure of these plants is not regarded as likely and not here "assured" against. That magnitude of failure would have national consequences calling for prompt Federal intervention with a mini-Manhattan Project.

Exercise A (pages 3-4) is based on one of AEC's alternate operating plans. It is well within the physical capabilities of its complex. The Exercise shows that a 27 million swu "assurance of supply" stockpile can be built up and worked off for a surcharge to AEC customers of less than \$1/swu. But to do so demands quick and decisive adoption of an "assurance" program and, from beginning to end, its aggressive operation and zealous financing. Only with these characteristics can such a program create and maintain credible "assurance of supply". These characteristics do not mark AEC's present decision making mechanisms and financing resources. Prompt restructuring of the government's enriching activities to incorporate them is essential.

Assistance

Exercise B (pages 5-6) is based on an AEC operating plan which preproduces an extra 12.4 million swu, changes tails assays and buys 21,000 short tons of added natural uranium feed. The new centrifuge plants would get preproduction at its cost of about \$56/swu and allowed to market it at the commercial price, say \$80/swu, thus being "assisted" by the \$24 differential. Against an approximate \$1 billion investment for a 3 million swu plant, the scheme nets less than \$54 million in "assistance" It is no bargain.

The most efficient way to raise money to "assist" these new plants is by the straightforward addition of a surcharge to AEC sales. Over the 1975-1987 operating period of my hypothetical "Assurance of Supply"/"Assistance" Program, AEC will perform about 285 million swu's of enriching services. The "assistance" value to each of the six new plants of a \$1.00 boost in swu charge is \$47.5 million, calculated as follows:

$$285 \times \$1 = \frac{\$285}{6} = \$47.50$$

Thus, a \$5 surcharge will garner \$237.5 million in aid for each new plant, a sum likely to far exceed all the conceivable front end costs of getting this new industry on its feet.

The Real World *based on assumptions.*

Exercises A and B are only hypotheses. In the real world, actual circumstances such as these must be dealt with:

- o We must stop thinking in terms of "AEC" and start thinking in terms of "the government" as it may be ERDA or USEC or another authority which soon takes over responsibility for U.S. enriching activities and stockpiles.
- o Scuttling the government's split-tails operation is inevitable and the sooner the better for the "assurance" program and the health of the mining, milling and conversion link of the nuclear fuel chain.
- o The government probably can find legal ways to boost its swu charges toward commercial levels. It's a good idea to start moving nearer to reality and away from extant Alice-in-Wonderland swu pricing criteria.
- o Exercise A shows that AEC Plant 3 1/2 is not needed. Accordingly, I am dropping authority for any new government enriching capacity from USEC.
- o USEC, now better than ever, is still the only game in town effecting the restructure of government enriching activities requisite for a credible "assurance of supply" program.

Other realities also must be coped with, such as the fact that utilities are slowing down their nuclear programs. By 1982, in relation to what they have contracted for, there is a likely delay in nuclear fuel demand aggregating 30 to 40 million swu's of separative work. Dealing with the responsibilities and seizing the opportunities presented by that, and any other unexpected nuclear fuel developments seem quite beyond the present AEC's room for maneuvering.

Utilities bound to contracts for the delayed separative work will be hard pressed to take and pay for it on schedule, only to bear added carrying charges until they start using it. A scheme to somewhat relieve their burden could be built around the government picking up this excess for stockpile purposes in lieu of otherwise preproducing part or all of the "assurance" stockpile. These swu's would come at the regular \$50 production cost rather than (text continues at page 7)

EXERCISE A

("Assurance of Supply" 27 million swu)

	<u>Preproduction</u> <u>10⁶ swu</u>	<u>Incremental</u> <u>Cost @ \$30</u> <u>10⁶ \$</u>	<u>10%/Yr Carry-</u> <u>ing Charge</u> <u>8 Yrs to 1 Yr</u>
1975	5.1	153	122.4
1976	7.1	213	149.1
1977	2.7	81	48.6
1978	4.8	144	72
1979	3.2	96	38.4
1980	1.5	45	13.5
1981	1.1	32	6.6
1982	1.5	45	4.5
Totals	27.0	809	455.1

This preproduction stockpile of 27 million swu's cost \$1265.1 million by the end of year 1982 (\$810 for enriching and \$455.1 for carrying charges).

The scheme for working off this stockpile is based on EEI's estimate that UEA's 9 million swu plant will handle load growth for 1 1/2 years after 1982 and that thereafter the new capacity requirement will average 6 million swu's annually.

This means that the 9 million swu's accumulated for "assurance of supply" for the UEA plant will, in 1983, go either physically to UEA's utility customers if the plant fails to get on line, or if it succeeds, AEC ~~would~~ will reduce its 1983 production by 9 million swu's to effect the cutback. The 18 million swu's accumulated to "assure supply" for customers of the 6 centrifuge plants would be worked off as these plants are assumed to coming on line to meet load growth, i.e. 3 million swu in 1983, 6 million each in 1984 and 1985, and the final 3 million in 1986.

(Exercise A - continued)

Thereupon the total cost of this "assurance of supply" program may be calculated as follows:

	<u>Stockpile Size in 10⁶ swu's</u>	<u>Year's Carrying Charge 10%</u>
1983	18	84.4
1984	15	70.1
1985	9	42.2
1986	3	14.1
1987	--	---
Investment Through 1982	--	<u>1265.1</u>
Total		\$1475.9

AEC's 1975 - 1982 Separative Work Production

<u>Units</u>	<u>Investment</u>	<u>Avg./swu</u>
126.7 for customers	\$6335	\$50.000000
<u>27</u> for preproduction	<u>1475.9</u>	54.662962
153.7 total	\$7810.9	\$50.819128

*Surcharge
for operating
the stockpile*

NOTES:

(1) Exercise A is based on AEC's alternative operating Plan 2 in Table 3 appended to George F. Quinn's testimony submitted to JCAE June 25, 1974, except that it requires 1.5 million swu preproduction in 1982 vice .4 million.

(2) The cumulative stockpile achieved in 1982 by all AEC preproduction is 42 million swu's of which, in this Exercise, 27 million is allocated to "assurance of supply" and 15 million to AEC's own purposes, i.e., 5 million flywheel and 10 million for contingencies. The carrying charge for this 15 million is included in the assumed \$50/swu charge to AEC's regular customers.

(3) The assumed cost of \$50/swu for regular production is arbitrary and the \$30/swu incremental cost for preproduction is based on \$2.50 for labor and \$27.50 for power @ 11 mills. Any 1 mill change in power cost effects about a \$2.50 change in swu cost.

EXERCISE B

("Assurance of Supply" 27 million swu - "Assistance" 12.4 million swu)

	<u>Preproduction 10⁶ swu</u>	<u>Cost @ \$30 (10⁶ \$)</u>	<u>10%/Yr Carry- ing Charge 8 Yrs to 1 Yr</u>	<u>Feed & Con- version 10⁶ (Short Tons)</u>	<u>Cost @ \$20/lb</u>	<u>10%/Yr Carry- ing Charge 7 Yrs to 1 Yr</u>
1975	6.4	192	153.6	---	---	---
1976	7.1	213	149.1	1.5	60	42
1977	4.5	135	81	7.5	300	180
1978	6.8	204	102	11.2	448	224
1979	5.7	171	68.4	8.3	332	132.8
1980	3.7	111	33.3	5.1	204	61.2
1981	3.5	105	21	4.1	164	32.8
1982	1.7	51	5.1	.8	32	3.2
Totals	39.4	1182	613.5	38.5	1540	676

This preproduction stockpile of 39.4 million swu's cost \$2471.5 million by the end of 1982 (for enriching \$1182, for carrying charge on enriching \$613.5, and for carrying charges on feed purchases \$676. The cost of feed is not included in the total since this exercise is solely for the purpose of determining swu costs. Feed cost -- equivalent to \$39.086284 for each swu -- would be recovered from customers at the time enriched uranium is delivered.)

The scheme for working off this stockpile is based on EEI's estimate that UEA's 9 million swu plant will handle load growth for 1 1/2 years after 1982 and that thereafter the new capacity requirement will average 6 million swu's annually.

This means that the 9 million swu's accumulated for "assurance of supply" for the UEA plant will, in 1983, go either physically to UEA's utility customers if the plant fails to get on line, or if it succeeds, AEC would reduce its 1983 production by 9 million swu's to effect the cutback. The 18 million swu's accumulated to "assure supply" for customers of the 6 centrifuge plants would be worked off as these plants are assumed to coming on line to meet load growth, i.e. 3 million swu in 1983, 6 million each in 1984 and 1985, and the final 3 million in 1986.

It is arbitrarily assumed that the 12.4 swu's accumulated to "assist" the centrifuge entrepreneurs will be worked down as follows: .4 in 1982, and 3 million during each of the years 1983, 1984, 1986 and 1987.

Thus the 5 year campaign to dispose of the combined "assurance of supply" and "assistance" stockpiles would be as follows: 9.4 million in 1983, 6 million in 1984, 9 million each in 1985 and 1986, and 3 million in 1987. Total: 39.4 million.

(Exercise B - continued)

Thereupon the total cost of the "assurance" and "assistance" programs may be calculated as follows:

	<u>Stockpile Size in 10⁶ swu's</u>	<u>Year's Carrying Charge 10%</u>
1983	30	188.2
1984	24	150.5
1985	15	94.1
1986	6	37.7
1987	--	--
Investment Through 1982		<u>2471.5</u>
Total.		\$2942

AEC's 1975 - 1982 Separative Work Production

<u>Units</u>	<u>Investment</u>	<u>Avg./swu</u>
126.7 for customers	\$6335	\$50.000000
<u>39.4</u> for preproduction	<u>2942</u>	<u>74.670050</u>
166.1 total	\$9277	\$55.851896

NOTES:

(1) Exercise B is based on AEC's alternative operating Plan 1A in Table 5 appended to George F. Quinn's testimony submitted to JCAE June 25, 1974.

(2) See notes (2) and (3) to Exercise A for explanations of AEC's responsibility for 15 million swu's of the stockpile and assumptions re swu costs. The assumed average feed and conversion cost equivalent to \$20/lb U₃O₈ is a best guess.

the \$30 incremental cost. Another consideration is that the government's complex must have feed to work on and the utilities will have to deliver it according to contract schedules, irrespective of their delayed need for separate work.

How would the \$30/\$50 swu differential be fairly adjusted? How should the utilities' burden for carrying charges on the feed be eased, if at all?

These, and a host of other unknowns that the future will reveal, will have to be resolved by whoever is in charge of the U.S. government's enriching activities. This must be done aggressively in a financially responsible manner, promptly, skillfully, intelligently, flexibly, effectively, and always with the overall national interest foremost in mind.

All of which serves to emphasize what was earlier written, to wit: "USEC ... is still the only game in town effecting the restructure of government enriching activities requisite for a credible "assurance of supply" program."



RESPONSE PROFILE

DOC		RECD		LOG NBR		INITIAL ACTION O
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12	18	12	18	11	7406224	<i>Elliott</i>

TO: PRES _____ FROM: *Jones J* KISSINGER, W _____ S/S _____
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 SCOWCROFT *+* _____ SCHLESINGER, J _____
 DAVIS _____ ST EX SEC _____

REFERENCE: CIRCLE AS APPROPRIATE
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SUBJECT: *NSC items requested on Out Memo re Rep. Hasmer's papers on Uranium enrichment - NSM 209*

INTERNAL ROUTING AND DISTRIBUTION

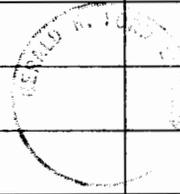
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LATIN AMERICA			
UNITED NATIONS			
ECONOMIC			
SCIENTIFIC	<i>+</i>		
PROGRAM ANALYSIS			
NSC PLANNING		<i>+</i>	
CONGRESSIONAL		<i>+</i>	
OCEANS POLICY			
INTELLIGENCE			

ACTION REQUIRED

MEMO FOR HAK _____
 MEMO FOR PRES _____
 REPLY FOR _____
 APPROPRIATE ACTION _____
 MEMO _____ TO _____
 RECOMMENDATIONS *to Jerry Jones **
 JOINT MEMO _____
 REFER TO _____ FOR _____
 ANY ACTION NECESSARY? _____
 CONCURRENCE _____
 DUE DATE: *12-20*

COMMENTS: (INCLUDING SPECIAL INSTRUCTIONS)
by phone if appropriate 12-19-74 Clearance given by phone. D.E.

DATE	FROM	TO	S	SUBSEQUENT ACTION REQUIRED (OR TAKEN):	CY TO
<i>12/19</i>				<i>Concurred by phone per Elliott</i>	
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DISPATCH _____
 CY RQMTS: SEE ABOVE PLUS: _____
 NOTIFY *Jones* & DATE *12/19* BY *Elliott*
 SPECIAL DISPOSITION: _____
 CROSS REF W/ _____
 SUSPENSE CY ATTACHED: *+* FOLDER: _____

MICROFILM & FILE RQMTS:
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