

REPORT TO THE CONGRESS

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BY THE COMPTROLLER GENERAL
OF THE UNITED STATES



Comments On Proposed Legislation To Change Basis For Government Charge For Uranium Enrichment Services

Energy Research and Development Administration

The Energy Research and Development Administration proposes legislation that would change the basis of the Government's charge for uranium enrichment services from the current cost recovery method to enable the Government to

- obtain fair value for its enrichment services and
- eliminate or reduce the difference between the Government's charge and those of potential private enrichers.

GAO found that assumptions made by the Agency in developing its proposed prices are within a reasonable range.

The Joint Committee on Atomic Energy should consider revisions to the proposed legislation so that any changes in the basic approach to carrying out the intent of the legislation be submitted to that Committee for approval.



COMPTROLLER GENERAL OF THE UNITED STATES

WASHINGTON, D.C. 20548

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The Honorable John O. Pastore
Chairman, Joint Committee
on Atomic Energy
Congress of the United States

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Dear Mr. Chairman:

In response to your June 27, 1975, request and subsequent discussions with your office, we have evaluated the Energy Research and Development Administration's proposed legislation to change the basis of the Government's charge for uranium enrichment services. The proposed legislation provides that the Administrator's charge for enrichment services be on a basis that will recover not less than the Government's costs over a reasonable period of time and, in the opinion of the Energy Research and Development Administration Administrator, will not discourage developing domestic supply sources independently of the Energy Research and Development Administration.

The objectives of the proposed legislation are to (1) obtain fair value for enrichment services and (2) eliminate or reduce the difference between the Government's charge and those of potential private enrichers.

We found that:

- If the proposed legislation were enacted, the Energy Research and Development Administration would initially implement the law by increasing its enrichment services charge to \$76 for each separate work unit to include amounts representing costs (commercial-type costs) which would normally be incurred and considered in a commercial firm's charge. The Energy Research and Development Administration believes the \$76 charge would also be adequate to achieve the second objective of the proposed legislation.

- The Energy Research and Development Administration's assumptions in arriving at the commercial-type charges are in a reasonable range of assumptions that could have been made; however, they are judgmental, and it is difficult, if not impossible, to conclude that they are the most reasonable assumptions. Other equally reasonable assumptions could be made to support a different charge, either higher or lower.

CHAPTER 1

INTRODUCTION

BACKGROUND

Nuclear reactors operating in the United States use enriched uranium as fuel. Enrichment involves separating the two principal isotopes of uranium found in nature to increase the percentage of the fissionable uranium isotope (uranium-235). Three Government-owned plants now enrich uranium in this country. They are located at Oak Ridge, Tennessee; Paducah, Kentucky; and Portsmouth, Ohio. The charge of enriching services is currently based on recovering the Government's cost over a reasonable period of time. All other phases of the nuclear fuel cycle, such as uranium ore mining and milling, are privately owned and priced on a commercial basis.¹

The Energy Research and Development Administration (ERDA)² plans to change this situation and has submitted two legislative proposals which could encourage private industry to enter the uranium enrichment field. One legislative proposal, submitted on July 8, 1975, provides various Government assistance and assurances to industrial firms that become involved in uranium enrichment. We are evaluating this proposal and will issue a report on it at a later date.

ERDA submitted the other legislative proposal to the Congress on June 24, 1975. The proposed legislation states that ERDA's charge for uranium enrichment services shall be on a basis that will recover not less than the Government's cost over a reasonable time and, in the opinion of the ERDA Administrator, will not discourage developing domestic supply sources independently of ERDA. The Chairman of the Joint Committee on Atomic Energy asked us to evaluate this proposal.

¹There are presently no commercial reprocessing plants. However, one reprocessing plant operated in the past and two are under construction.

²The Energy Reorganization Act of 1974 (Public Law 93-438) abolished the Atomic Energy Commission and established ERDA and the Nuclear Regulatory Commission effective January 19, 1975.

--The proposed legislation would permit the Energy Research and Development Administration to revise the charge if the Administrator determined that the existing charge discouraged developing domestic supply sources. Energy Research and Development Administration officials told us that they planned to add an amount, if needed, to the fair value charge to prevent discouraging domestic development. Although the Energy Research and Development Administration would notify the Joint Committee on Atomic Energy before revising charges, congressional concurrence would not be required.

The Joint Committee should consider revising the legislative proposal so that (1) any changes in the basic approach used in arriving at the fair value charge for the Government's uranium enrichment services and (2) any additions to this charge necessary for not discouraging development of private supply sources would be included in the uranium enrichment criteria and would be submitted for approval to the Joint Committee.

We have discussed this report with the Energy Research and Development Administration officials and have included some of their comments. We will contact your office in the near future to arrange for the release of this report so that copies can be provided to other congressional committees and to interested Members of the Congress.

Sincerely yours,

A handwritten signature in cursive script that reads "James B. Stewart".

Comptroller General
of the United States

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ABBREVIATIONS

AEC	Atomic Energy Commission
ERDA	Energy Research and Development Administration
SWU	separative work unit

SCOPE OF REVIEW

We made our review at ERDA headquarters, Germantown, Maryland, and (1) examined selected aspects of the proposed legislation and the history of related legislation, (2) analyzed the specific assumptions behind the proposed price, and (3) verified the price computations. We did not audit the accuracy of all the data used to support the calculations.

We obtained the views of ERDA employees knowledgeable of, and responsible for, pricing enrichment services. We also obtained the views of four potential private enrichers on the proposed price change.

CHAPTER 2

COMMENTS ON

ASPECTS OF THE PROPOSAL TO CHANGE

THE PRICE FOR ENRICHING SERVICES

The Private Ownership of Special Nuclear Materials Act of 1964 (Public Law 88-489) authorized the Atomic Energy Commission (AEC) to offer services beginning in January 1969 for enriching privately owned uranium. The act also provided that AEC establish criteria setting forth the terms and conditions under which enriching services are made available, including the requirement that prices be established on the basis of providing reasonable compensation to the Government. The Atomic Energy Act was amended on December 19, 1970 (Public Law 91-560), changing the basis used to establish prices from "reasonable compensation to the Government" to "recovery of the Government's cost over a reasonable period of time."

Before December 1972 AEC offered requirements contracts in which it agreed to provide the enrichment services for a stated nuclear reactor on an as-needed basis up to a definite limit with only 120 days' advance notice. Starting in May 1973, AEC offered fixed-commitment contracts wherein customers must specify delivery leadtime at least 8 years for initial delivery and 10 years for subsequent deliveries and must make a large downpayment. Since June 1974 ERDA has contracted for its entire enrichment capacity.

On June 20, 1975, ERDA announced an increase in charges for enrichment services under fixed-commitment contracts from \$42.10 for each separate work unit (SWU)¹ to \$53.35 per SWU effective August 20, 1975. Similarly, the charge for requirements-type contracts will be increased on December 18, 1975, from \$47.80 a unit to \$60.95 an SWU or a ceiling charge, whichever is lower, on the basis of a formula specified in the contract. These revised charges are to recover increased power and other operating costs and costs not directly related to ERDA's legislative proposal.

¹ERDA expresses the production capacity of its plants as SWUs. An SWU is not a quantity of material but is a measure of the effort used to separate a given quantity of uranium feed into two streams, one having a higher percentage of uranium-235.

If the proposed legislation were enacted, ERDA would initially implement the law by including some commercial type charges in the basis for establishing the Government's charge for uranium enrichment services. These new charges would increase the price of an SWU to about \$76 for all existing fixed-commitment contracts. In our review of the ERDA proposal, we concentrated on four aspects:

- The rationale for seeking a price change.
- The basis for the specific price proposed.
- Congressional oversight on future price changes.
- Pricing structure for foreign customers.

RATIONALE FOR SEEKING A PRICE CHANGE

ERDA has stated that legislation is needed to obtain fair value for enriching services sold to domestic and foreign customers and to eliminate or reduce the difference between the Government's charge for enriching services and those of potential domestic private enrichers. ERDA believes that the proposed legislation would enable the Government to provide enrichment services on an unsubsidized basis.

Current prices based on recovery of the Government's cost are much lower than can reasonably be expected for any future commercial source because they do not include all costs associated with a commercial activity, such as Federal, State, and local taxes, insurance, and a return on equity. ERDA is proposing that, in arriving at a fair value, the charge for enrichment services include amounts for these types of costs.

The proposed charge of \$76 an SWU is higher than ERDA's current cost but lower than the charge projected by potential suppliers. On the basis of private industry's enrichment proposals, the commercial charge for enriching uranium would initially be about \$100 an SWU but would drop to an average charge of about \$85 an SWU over a 25-year period. ERDA's proposed charge is about midway between its existing cost recovery price of \$53 an SWU for fixed-commitment contracts and the estimated initial commercial charge of \$100 an SWU. ERDA believes that its proposed charge of \$76, even though much lower than the initial commercial charge, will be high enough to remove any barriers that may prevent utilities from entering into enrichment contracts with private industry. If it becomes necessary, ERDA plans to add to its fair value charge an amount high enough to remove such barriers.

Since the Government's capacity is fully contracted for, its enrichment charge has little competitive importance to the potential private enrichers. However, if the Government constructs additional capacity, its price will influence whether utilities contract with the Government or with potential private enrichers. One potential private enricher told us that the \$76 charge was in the range of what was needed to remove these barriers, but two others told us the charge was too low. Establishing this price involves predictions of what potential domestic enrichers might charge and is therefore subject to many uncertainties.

BASIS FOR THE PROPOSED CHARGE OF \$76

The factors ERDA considered in establishing the proposed charge represent some expenses of the types normally incurred by private industry, such as insurance costs and Federal, State, and local taxes. ERDA's proposed charge of about \$76 an SWU is not intended to represent the commercial charge of enriching services and accordingly does not include a provision for return on equity. In addition, ERDA's charge includes depreciation based on the construction cost of Government facilities built 20 to 30 years ago. Such expense would be much higher today for a commercial firm.

In arriving at a \$76 charge, ERDA made several assumptions regarding financial and economic conditions and also made several changes to factors supporting the existing charge. ERDA plans to periodically review the charge and to make the necessary adjustments to reflect changing financial and economic conditions.

ERDA's assumptions and changes in arriving at its proposed price appear to be in the range of reasonable assumptions and changes that could have been made.

Discount rate used in present value computation

ERDA computes the present value of future costs and sales in arriving at its uranium enrichment charges. In its existing cost recovery charge, ERDA used a 6-1/2-percent discount rate which was based on the Government's average cost to borrow money. In computing its proposed charge, ERDA used a 12-percent discount rate. The 12-percent rate has two components: (1) 10-percent factor, representing the estimate average rate of return on private investment, before taxes and after inflation, specified in Office of Management and Budget Circular No. A-94, Revised, and (2) a 2-percent factor ERDA added to indicate the above-average risk associated with uranium enrichment.

Selecting the discount rate is a judgmental consideration that has a major effect on the charge for each separate work unit. The following table shows the effect of different discount rates of an ERDA charge for an SWU, assuming all other assumptions remain constant.

<u>Discount rate</u>	<u>Charge</u>
6-1/2%	\$61.41
10	70.24
12	75.58
14	81.15

Provision for Federal income tax

ERDA has developed an economic model to arrive at the provision for Federal income tax. ERDA used a corporate income tax rate of 48 percent and a 16-year depreciation period in its tax computation. The model used a series of financial assumptions. They are:

- 50 percent of initial investment in debt.
- 50 percent of initial investment in equity.
- 8.3-percent interest rate on debt.
- 15-percent earning rate on equity.

Debt-equity ratio

ERDA assumed a ratio of 50-percent debt and 50-percent equity as reasonably representing the debt-equity ratios of the electric utility industry. However, the enriching enterprise is not directly comparable to any particular segment of commercial industry. Therefore judgment is involved in establishing a reasonable ratio.

The table below shows the range of charges for the tax provision that can be obtained by changing the debt-equity ratio and by leaving all other assumptions the same.

<u>Debt-equity ratio</u>	<u>Tax provision per SWU</u>
70:30	\$ 4.62
50:50	12.32
30:70	20.47

Return on equity and interest debt

ERDA assumed a 15-percent return on equity and an 8.3-percent interest rate on debt in developing the Federal income tax provision of its proposed charge. ERDA's return-on-equity rate was based on Federal Power Commission and public utility estimates that a 15-percent return was needed to attract capital. The interest on debt corresponds to debt yields on highly rated bonds at the time the calculations were made.

The median return on stockholders' equity of the 500 largest industrial corporations for 1973 and 1974 was 12.4 percent and 13.6 percent, respectively, and the industry medians ranged from 8.2 percent for textile companies to 18.1 percent for pharmaceutical companies in 1973 and from 6 percent for textile companies to 23.2 percent for mining companies in 1974. The median return on stockholders' equity for large chemical operations, to which the enrichment process can be compared, was 11.6 percent in 1973 and 15.6 percent in 1974.

Since January 1970 the interest rate on certain highly rated bonds has ranged from 7.08 percent in February 1971 and December 1972 to 9.27 percent in October 1974.

The tables below illustrate the variations in the tax provision portion of ERDA's proposed charge of \$76 an SWU that would result from a change in the rate of return on equity or interest on debt, all other assumptions remaining constant.

Effect of a change in rate of return

<u>Rate of return</u>	<u>Tax provision per SWU</u>
9%	\$ 4.46
10	5.73
12	8.31
15	12.32
18	16.47

Effect of a change in interest on debt

<u>Interest rate</u>	<u>Tax provision per SWU</u>
6.5%	\$12.19
7.3	12.25
8.3	12.32
9.3	12.39

Provision for other taxes and insurance

ERDA arrived at its provision for State and local taxes and insurance by determining the amount paid for these items by two of its power suppliers--Ohio Valley Electric Corporation and Electric Energy, Incorporated. State and local taxes and insurance for these utilities averaged about 1 percent of their gross investment. On this basis ERDA estimated that the provision for other taxes and insurance would be \$2.15 an SWU.

The adequacy of this component cannot be determined because State and local taxes and insurance could vary appreciably from location to location, and exact localities of potential private enrichers are not known.

Provision for carrying charge on uranium in working inventory

Recent ERDA studies have shown that a working inventory of enriched uranium representing about 3 months' production is required. An inventory carrying charge on the uranium contained in this inventory is now prohibited by the uranium enrichment criteria. The proposed legislation would permit a charge on the 13 million kilograms of uranium in the working inventory. The effect of such a charge depends on the discount rate used. For a 12-percent rate, the carrying charge would add \$3.36 an SWU, whereas a 6-1/2-percent rate would add \$1.68.

Additional provision for research and development

ERDA's existing charge for uranium enrichment services includes costs associated with research and development of new uranium enrichment technologies. ERDA proposes to increase the base of this charge by approximately \$25 million annually to include research and development into advanced methods of uranium enrichment. This will increase the charge by about \$2.09. A higher or lower cost would result in a proportional change to the SWU charge.

CONGRESSIONAL OVERSIGHT ON PRICE CHANGES

Subsection 161v of the Atomic Energy Act of 1954, which was added by the Private Ownership of Special Nuclear Materials Act (Public Law 88-489), requires ERDA to establish written criteria for the terms and conditions under which ERDA would provide uranium enrichment services to domestic and foreign customers. Before ERDA establishes such criteria,

it must submit the proposed criteria to the Joint Committee on Atomic Energy for a 45-day period, unless the Joint Committee waives, in writing, the conditions of all, or any portion of, the period. Current legislation permits ERDA to revise only its charge to indicate changes in costs. Congressional approval is required to change or modify the criteria used to compute uranium enrichment charges.

The proposed legislation states that ERDA's charge for enrichment services shall be on a basis that will recover not less than the Government's costs over a reasonable period of time and, in the opinion of the ERDA Administrator, will not discourage developing domestic sources of supply independently of ERDA. The proposed legislation does not establish a pricing formula nor does it set a ceiling.

The proposed legislation would permit ERDA to revise the price structure if the Administrator determined that the existing price discouraged developing domestic sources of supply. Although ERDA would notify the Joint Committee on Atomic Energy before revising charges, congressional concurrence would not be required.

PRICE STRUCTURE FOR FOREIGN CUSTOMERS WITH REQUIREMENTS CONTRACTS

At the time the original uranium enrichment criteria were developed, cost data relative to operating the gaseous diffusion plant was classified. Thus the nuclear industry was not able to evaluate the basis for AEC's charge for enrichment services. AEC established a ceiling charge to provide its customers with some assurance that the price for enrichment services would not be above a certain maximum.

The May 9, 1973, revision to the criteria eliminated the ceiling charge for all new contracts, because the costs associated with operating the gaseous diffusion plants were no longer classified and were specified in ERDA's annual financial statements on uranium enrichment services. This was thought to provide enough protection to ERDA's customers.

The ceiling charge was originally set at \$30 an SWU with a provision that it could be increased for the cost of electric power and labor. The current ceiling charge is \$59.81. The proposed charge of \$76 is obviously higher than the ceiling charge, but ERDA will not be able to charge requirement contract holders above the ceiling charge because these contracts contain the following provision.

"The charge to be paid to the Commission (AEC) for enriching services provided to the customer hereunder shall be determined in accordance with the established Commission pricing policy for such services; provided, however, that the unit charge for enriching services during the term of this agreement shall in no event exceed a ceiling charge * * *."

About 25 percent of ERDA's requirements contracts are with foreign customers who will be charged a price lower than domestic and foreign customers with fixed-commitment contracts. The Joint Committee's staff asked us if this situation violated section 161v of the act which requires that prices charged foreign customers be no less than prices charged domestic customers.

The answer to this question is "no." The Joint Committee on Atomic Energy, in its 1964 reports regarding section 161v as originally enacted, stated that the section was intended to insure that prices to foreign parties should not be less than prices currently being charged by the AEC to domestic customers for enrichment services.¹ This provision was also indicated, in the remarks of the Committee Vice Chairman on the floor, that the bill provided for "similar" services to both domestic and international customers. Since the Congress' intent was to insure that the price to foreign parties for these services not be less than the prices being charged at that time to domestic customers, there is no support for the proposition that a price to a foreign customer which is below the price charged to any domestic customer (in any succeeding year) violates the provision in question.

Therefore a price rise necessitated by the proposed legislation for domestic customers under fixed-commitment contracts to a level above that price to foreign customers under requirements contracts would not conflict with section 161v of the Atomic Energy Act of 1954, as amended. The provisions of the law would be satisfied if ERDA insured that prices to be charged under the proposed legislation to foreign customers with fixed-commitment contracts would not be less than the prices to be then charged to domestic customers with fixed-commitment contracts.

¹H. Rept. 1702, 88th Cong., 2d sess. 30 (1964); S. Rept. 1325, 88th Cong., 2d sess. 30 (1964).

CONCLUSION

The proposed legislation would further amend the Atomic Energy Act of 1954 by revising the bases for establishing prices for ERDA's uranium enrichment services. ERDA has stated that such authority is needed for it to (1) obtain fair value for enrichment services sold to domestic and foreign customers and (2) eliminate or reduce the differential between the Government's charges for enriching services and those of potential domestic private enrichers. ERDA believes that its current uranium enrichment charges are so low that they deter uranium enriching services customers' considering of domestic private enrichment services.

To carry out the proposed legislation, ERDA expects to establish a price of about \$76 an SWU as a fair value for its enriching services. In arriving at this price, ERDA added to the cost it incurs for enriching uranium certain amounts representing such costs as Federal, State, and local taxes and insurance (commercial-type charges) which would normally be incurred and which would be included in the price charged by a private enricher. ERDA made several assumptions in arriving at these commercial-type charges. ERDA's assumptions are judgmental, and it would be difficult, if not impossible, to say that these are the most reasonable assumptions to be made. Other equally reasonable assumptions could be made to support another price, either higher or lower.

ERDA said that the \$76 an SWU charge would represent a fair value (a price above actual cost) to the Government for its enrichment services and be sufficient at this time to not discourage uranium enrichment services customers' considering domestic private enrichment services.

We recognize, however, that a fair value charge may not be sufficient to accomplish the second objective of not discouraging enriching customers from considering domestic private enrichers. ERDA said that, if it became necessary, it planned to add an amount to the fair value charge to meet this objective. Establishing this amount would necessarily involve predictions of what future enrichers might charge, considering such factors as improvements in current enrichment technology and increases in construction costs. Thus this amount may have to be adjusted when better information as to private enrichers' cost and pricing policies becomes known.

Because of the various implications that the Government's charges for uranium enrichment could have on private enrichers, utilities, and ultimately the consumer, we feel it

would be desirable if the Congress to retain control over establishing the Government's uranium enrichment charges.

MATTER FOR CONSIDERATION BY
THE JOINT COMMITTEE ON ATOMIC ENERGY

The Joint Committee should consider revising the legislative proposal so that the Joint Committee retains control over the establishing the Government's uranium enrichment charges by requiring that (1) any changes in the basic approach used in arriving at the fair value charge for services and (2) any additions to this charge necessary for not discouraging development of private supply sources be included in the uranium enrichment criteria and submitted for approval to the Joint Committee.