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The Federal Uranium Enrichment Program and the Criteria and Full Cost Recovery Requirements of Section 161 of the Atomic Energy Act

BY CHARLES H. MONTANGE*

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INTRODUCTION

“But such mistakes are not new; history is full of the errors of states and princes. . . . Those who govern, having much business on their hands, do not generally like to take the trouble of considering and carrying into execution new projects.”¹

The Department of Energy [hereinafter DOE] runs the Government’s multi-billion dollar uranium enrichment business, and is accordingly responsible for the reliable supply of nuclear fuel to the vast majority of nuclear utilities in the United States as well as to many nuclear utilities in other countries. Important questions have arisen concerning DOE’s compliance with key provisions of law relating to its enrichment business. According to DOE, the continued existence of the agency as a reliable and competitive supplier of enrichment services may hinge on the answers to these questions. The basic energy independence of the United States in the nuclear electrical power area may therefore also be implicated.

I. THE PROBLEM

Nuclear fuel used in most nuclear power reactors is comprised of two basic inputs: natural uranium and enrichment services.² Enrichment services, commonly sold in units of “sep-

*Member, D.C. Bar. The author has advised clients, particularly in the uranium supply industry, concerning the requirements of section 161v. of the Atomic Energy Act. The author appreciates assistance received from B. Jeanine Hull, the staff of the General Accounting Office and the staff of the House Committee on Interior and Insular Affairs in pointing out some of the information referenced in, and in reviewing some of the drafts of, this paper. The author also wishes to thank the numerous officials of the Department of Energy whose statements stimulated his interest in this subject. The reader may be assured, however, that the views expressed herein are solely the author’s own. Finally, the author thanks Anne Carson and Martha Foster for dredging up some of the materials on which this paper relies.

¹ B. FRANKLIN, AUTOBIOGRAPHY 161 (M. Farrand ed. 1949).

² The uranium fuel cycle consists of six essential fuel processing steps. *First*, uranium ore is mined from its deposits in nature. *Second*, the ore is put through a milling process in which it is concentrated in a commercial product referred to as “yellowcake,” usually in the form of uranium oxide or U₃O₈. *Third*, the yellowcake is converted to a gas, uranium hexafluoride, or UF₆. *Fourth*, the uranium hexafluoride is enriched at a uranium enrichment plant. *Fifth*, the enriched uranium hexafluoride is converted to ceramic uranium dioxide pellets and encased in long, slender sealed rods which are arranged in fuel assemblies. On average, a typical 1 gigawatt reactor will refuel every 18 months. During each refueling, one-third of the reactor’s fuel supply is replaced. A complete core contains roughly 585 kilograms of nuclear fuel. *Sixth*, and

arative work" or "SWU's," are necessary to increase the concentration of the fissionable isotope U-235 in a given quantity of uranium from the ratio of approximately 0.7% (which occurs in nature) to the range of 2% to 4%.³ The federal government, through the Atomic Energy Commission [hereinafter AEC] and its successors, the Energy Research and Development Administration [hereinafter ERDA]⁴ and DOE,⁵ has always been the sole domestic supplier of uranium enrichment services and, until recently, was the sole supplier to the Free World. So long as the United States Government enjoyed a monopoly position, it could freely establish prices and conditions for the sale of enrichment services.

Perhaps erosion of the federal monopoly by foreign interests was inevitable, but the United States unquestionably pursued policies hastening that erosion. One factor accelerating the end of the monopoly was loss of control over the costs of the federal

finally, when the enriched fuel has been depleted, the spent fuel assemblies must be removed from the reactor core and stored indefinitely. See CONG. BUDGET OFFICE, U.S. URANIUM ENRICHMENT: OPTIONS FOR A COMPETITIVE PROGRAM 3 (1985) [hereinafter CBO]; *Proceedings of the Tri-Committee Business Advisory Panel on Uranium Enrichment, Hearings Before the Committee on Interior and Insular Affairs*, 98th Cong., 2d Sess. 18 (1984) [hereinafter Business Panel] (statement of John R. Longenecker, Deputy Assistant Secretary for Uranium Enrichment, Department of Energy). Most commercial utilities currently store their spent fuel under water in temporary facilities. The federal government has taken responsibility for providing for permanent disposal of all commercially generated spent fuel. This federal program will be financed from funds derived from a 1 mil/kwh fee on nuclear-generated electricity. See Nuclear Waste Policy Act, 42 U.S.C. § 10101 (1983).

¹ Natural uranium consists approximately 99.3% of the isotope U-238, which is not readily fissionable, and 0.7% of the isotope U-235, which is. Of these two isotopes, only U-235 can sustain a nuclear chain reaction and thus serve as a source of energy in a typical nuclear reactor.

Specially designed breeder reactors, none of which are currently in (or planned for) commercial operation in the United States, convert non-fissionable U-238 to fissionable plutonium-239 (or, alternatively, convert non-fissionable thorium-232 to fissionable U-233) and burn the "bred" fuel. Such systems are not so dependent upon enrichment services as are reactors designed for the customary uranium fuel cycle. The Canadian government has developed and currently markets a reactor system (the "Candu" system) which employs natural uranium and deuterium and does not require enrichment.

⁴ The Atomic Energy Commission was established by the Atomic Energy Act of 1946, 60 Stat. 755 (1946), and was re-constituted under the Atomic Energy Act of 1954, 24 U.S.C. § 2011 (1973) [hereinafter AEA]. The Atomic Energy Commission was abolished by the Energy Reorganization Act of 1974, Pub. L. No. 93-438, 88 Stat. 1233 (1974), and AEC's uranium enrichment activities were transferred to the newly formed Energy Research and Development Administration (ERDA). 42 U.S.C. §§ 5812 & 5814(c) (1983).

⁵ ERDA was abolished and its functions transferred to the DOE by the DOE Organization Act of 1977, 42 U.S.C. § 7151(a) (1977).

program. Forecasting an expanding market,⁶ the AEC (and its successors) in the 1970's invested billions of dollars in augmenting existing enrichment facilities⁷ and in developing new enrichment technologies.⁸ Recovering the costs of these investments required increased prices for enrichment. Additionally federal authorities signed enormous long-term "take-or-pay" electrical supply contracts with Tennessee Valley Authority [hereinafter TVA], requiring the federal enrichment program to pay TVA in excess of one billion dollars for electricity even if not used because of slower than expected growth in demand. Again the ground was laid for inflated costs. Other harbingers of the monopoly's end included government policies creating an artificial demand for enrichment. The AEC in 1974 required its customers to contract for enrichment well in advance of need,⁹ thus creating a situation in which a nuclear fuel glut would arise if planned nuclear expansion faltered. Another unfortunate development was direct federal encouragement of foreign competition. For example, in 1974, the federal government "closed its order books" forcing foreign governments to develop competing

⁶ During the 1970's, the Atomic Energy Commission and its successors, ERDA and DOE, forecast skyrocketing demand for nuclear generated electricity. See, e.g., AEC, *THE NUCLEAR INDUSTRY I* (1973); *Uranium Enrichment: Heading for the Abyss*, 221 *SCIENCE* 730, 731 (1983). Relying on these projections, Congress expected that some 1,000 commercial reactors would require licensing by the turn of the century in the United States alone. See S. REP. No. 93-980, 93d Cong., 2d Sess. at 19 & 77 (1974).

⁷ The chief augmentations were the \$1.5 billion "cascade improvement" and "cascade upgrading" programs (CIP/CUP). See Business Panel, *supra* note 2, at 74.

⁸ In 1976, Congress authorized the construction of additional uranium enrichment capacity at the Portsmouth (Ohio) Gaseous Diffusion Plant Site. In 1977, President Carter announced that gas centrifuge technology would be used for the new plant. Roughly \$2.8 billion has been spent on the gas centrifuge through FY 1985. In addition, \$0.8 billion in interest has been imputed. See Statement of J. Dexter Peach (GAO) before the Energy Cons. and Power Subcomm., House Comm. in Energy and Commerce, for release on Dec. 11, 1985 at 2.

Advocates of the gas centrifuge estimated that an additional \$4.2 billion in FY 1986 dollars would be required to bring a full-scale plant on line. See Post-Hearing Questions and Answers (Witness John Longenecker) Relating to the March 21, 1985 Hearing before the Subcommittee on Energy and Environment of the House Interior and Insular Affairs Comm., Q7 and Q11(a), reprinted in *Uranium Enrichment and Supply: Hearing Before the Subcomm. on Energy and Environment of the House Comm. on Interior & Insular Affairs*, 99th Cong., 1st Sess. 391-94 (1985).

⁹ AEC, for example, adopted the so-called long term fixed commitment contract (LTFC) for enrichment purposes. See generally *Proposed Changes in AEC Contract Arrangements for Uranium Enriching Services: Hearings Before the Subcomm. on Energy*, 93rd Cong., 1st Sess. (1973) [hereinafter 1973 Hearings].

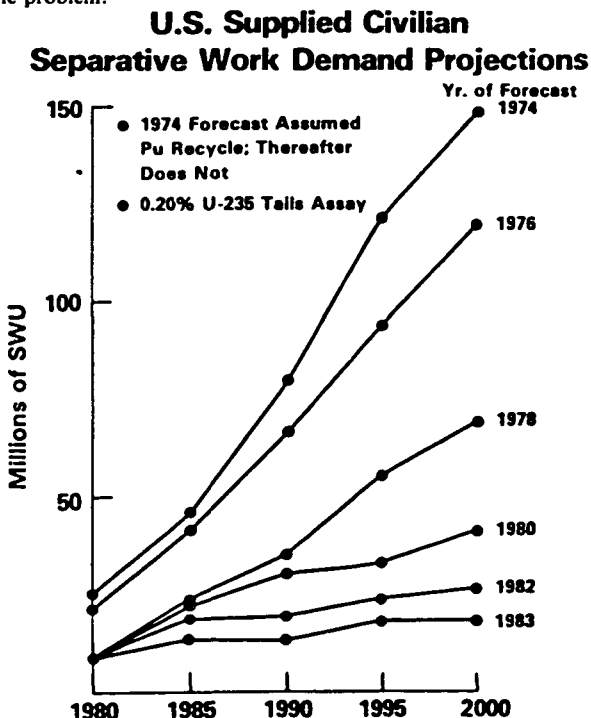
enrichment facilities.¹⁰

Unfortunately, AEC's demand forecasts were drastically in error.¹¹ Instead of accelerating, United States reactor orders drastically declined and disappeared after 1978. Order cancellations and schedule delays were epidemic. To make matters worse, nuclear programs slowed in other countries.

DOE is now faced with low priced competition, both from foreign enrichers¹² and from the so-called "secondary market"

¹⁰ See *Radical Surgery in Uranium Enrichment*, 228 *SCIENCE* 1407 (1985); *Uranium Enrichment Policy: Hearings Before the Subcomm. on the Energy Research and Development*, 95th Cong., 2d Sess. 43 (1978) [hereinafter 1978 Hearings]; F. Bujon, Welcome to the Business World—A Competitor's 'Unbiased' View of DOE's Enrichment Enterprise, Speech by President of Cogema at Atomic Industrial Forum Fuel Cycle Conference 3 (1986).

¹¹ DOE admits that its forecasts were "unrealistic." Business Panel, *supra* note 2, at 18. DOE in fact was mistaken by a factor of about 10. See *DOE Revises Its Uranium Enrichment Program*, PUB. UTIL. FORT., March 15, 1984, 47. The following chart drawn from DOE material published in Business Panel, *supra* note 2, at 17, illustrates the scope of the problem.



¹² DOE currently has three competitors, all government-owned. The first is Eurodif, over 50% owned by France, and the remainder by Spain, Italy, Belgium, and Iran. CBO estimates Eurodif's cost is approximately \$115/SWU. CBO, *supra* note 2, at 23. The second is Urenco, owned by West Germany, the United Kingdom, and the Netherlands. CBO estimates its cost per SWU is approximately \$90. *Id.* The third is Techsnabex-

(i.e., sales of surplus inventories in private hands). The agency is also confronted with expensive overcapacity,¹³ heavy payments to TVA for unused electricity,¹⁴ and (although this now may be changing) an unfavorable foreign exchange rate.¹⁵ The net result is sobering. DOE's costs are higher than the prices available on the secondary market or from Europe. The agency fears loss of business, and argues that such a loss may further increase its costs on a per unit of sales basis, causing yet further erosion of its market position.

Ordinarily, a business entity would respond by cutting costs, writing-off investments or taking a loss provided variable costs of production could be recovered. For the last two years, DOE officials have been trying to do exactly this.¹⁶ In addition to cutting costs, the agency has decided to take a \$4 billion loss, or "write-off." Indeed, in the proposed Fiscal Year 1987 Budget, DOE, through the Administration, formally announced its intent to write-off some \$4 billion of the government's \$7.5 billion enrichment investments.¹⁷ This write-off is a centerpiece of the rulemaking initiated by the agency on January 19, 1986,¹⁸ which

port, owned by the Soviet Union, whose costs are unknown but which reportedly prices to undercut DOE. *Id.* at 19.

¹³ Current enrichment capacity available to the Free World equals 41.5 million of SWU for 1985. Actual Free World demand is approximately 22 million SWU for 1985. *Id.* at XII and 15. About three-quarters of the excess capacity is enjoyed by the U.S. Government.

¹⁴ See Letter from J. Peach (GAO) to Senator Humphrey (July 15, 1983) (encl. 1). DOE estimates that it will pay a total of approximately \$1.2 billion to TVA for unused electricity. See also J. SIMPSON, FINAL REPORT [FOR DOE]: URANIUM ENRICHMENT ENTERPRISE OPTIONS STUDY 6 (Nov. 30, 1983) (\$1.3 billion in penalty charges); *Radical Surgery*, *supra* note 10, at 1407.

¹⁵ Business Panel, *supra* note 2, at 12, 13.

¹⁶ Among other things, DOE on January 18, 1984 announced the new "utility services" enrichment contract. Under this new contract, DOE pledged to reduce enrichment prices to a level no greater than \$135/SWU. The contract also contained features allowing DOE customers to reduce their contractual obligations to purchase enrichment to a level more related to actual demand given schedule delays and reactor cancellations. DOE also abandoned the gas centrifuge facility, thus saving four billion dollars or more in projected completion costs. Although the Administration has proposed to cancel AVLIS the agency is attempting to proceed with that economically more attractive ALVIS enrichment technology. DOE has announced that it was placing its Oak Ridge gaseous diffusion enrichment plant on standby and has endeavored to negotiate reductions in the billion dollar plus "demand changes" which it is obligated to pay TVA for electricity for which it contracted on a long term basis but is not using.

¹⁷ OMB, MAJOR POLICY INITIATIVES 88 (1986).

¹⁸ 51 Fed. Reg. 3624 (1986) (to be codified at 10 C.F.R. § 762).

concluded with issuance of new regulations on July 29, 1986.¹⁹ The prices which DOE currently charges its customers under its January 1984 Utility Services Enrichment Contract [hereinafter USEC] are predicated on such a write-off.

But DOE is not an ordinary business as it is owned by the taxpayers. The losses it sustains are not paid by shareholders who voluntarily assume such risks, but are assumed by all United States citizens. Under these circumstances, DOE "losses" arguably amount to subsidies to foreign and domestic utilities doing business with DOE or, alternatively, to the DOE contractors who built the excess capacity now beleaguering the agency. From a political point of view, one may well ask why taxpayers should subsidize nuclear utilities (by underwriting below cost enrichment), DOE contractors (by paying for unnecessary facilities), or both.²⁰

DOE also differs from an ordinary business in that it is subject to special statutory constraints. In particular, the Atomic Energy Act specifies a number of restrictions upon the manner in which DOE must conduct its enrichment business. The major restrictions are set forth in Section 161v. of the Atomic Energy Act [hereinafter AEA].²¹ The chief substantive requirement is that "any prices" for enrichment services "shall be [established] on a basis of recovery of the government's costs over a reasonable period of time."²² The chief procedural requirement is that DOE's enrichment contracts conform to written "criteria" adopted only after review by the Joint Committee on Atomic Energy, and, after disbandment of the Joint Committee in 1977,²³ by its successor—the Senate Energy and Natural Resources Committee and the House Committees on Energy and Commerce and on Interior and Insular Affairs.

The General Accounting Office [hereinafter GAO] argues that the federal government is now in violation of both the substantive and procedural requirements of Section 161v. of the

¹⁹ 51 Fed. Reg. 27133 (1986) (to be codified at 10 C.F.R. § 762).

²⁰ See *U.S. Uranium Enrichment Program Said Mismanaged*, Wash. Post, Mar. 11, 1986, at D1, col. 4; see also Civiak (Cong. Res. Serv.), *Cost Accounting, Pricing, and Cost Recovery in DOE's Uranium Enrichment Program* 16 (1985) (discusses OMB staff position that DOE should not "write-off" enrichment investment).

²¹ 42 U.S.C. § 2201(v) (1982).

²² *Id.*

²³ 42 U.S.C. § 2258 (1977).

AEA. In particular, the GAO repeatedly has indicated that DOE's "write-off" of some four billion dollars in enrichment capital investment is contrary to law.²⁴ GAO also contends that DOE's new enrichment contract when issued violated the Section 161v. "criteria" requirement.²⁵ Consonant with GOA's views, a federal district court has recently declared invalid DOE's new uranium enrichment contract, under which the agency has signed some twenty billion dollars worth of business.²⁶

In addition, serious doubts exist relating to DOE's compliance with rulemaking requirements applicable to the new enrichment contract under the Administrative Procedure Act [hereinafter APA] as modified by the DOE Organization Act. In particular, under Section 501(b)(3) of the DOE Organization Act,²⁷ DOE appears to be barred from either issuing a new generic enrichment contract or taking other generally applicable actions relating to its enrichment program without first complying with notice and comment rulemaking requirements under the APA and certain additional procedures specified in the DOE Act. DOE failed to comply with any of these requirements or procedures.²⁸

Although the agency denies the existence of a problem, its 1986 rulemaking is clearly intended to retroactively approve the new enrichment contract. In fact, retroactive approval of the contract is the express purpose of one of the provisions DOE purported to adopt on July 29. Congressional response to the situation has been largely negative. Language disapproving DOE's new criteria was appended to the Senate version of a debt ceiling bill.²⁹ The House of Representatives considered a proposed joint

²⁴ See, e.g., Letter from Comptroller General to the Honorable John D. Dingell (Dec. 27, 1984) [hereinafter GAO Letter]; Letter from J. Dexter Peach (GAO) to the Honorable John D. Dingell and Richard L. Ottinger (August 10, 1984); Statement of J. Dexter Peach before the Energy Cons. & Power Subcomm., House Comm. on Energy & Commerce (for release Dec. 11, 1985); GAO, Financial Audit, DOE Uranium Enrichment Activity Financial Statements: Sept. 30, 1984, at 1 (May 1986); Statement of Keith Fultz (GAO) before the Energy and Env. Subcomm., House Comm. on Interior and Insular Affairs (August 14, 1986).

²⁵ See, e.g., GAO Letter, *supra* note 24.

²⁶ *Western Nuclear, Inc. v. Huffman*, No. 84-C-2315 (D. Colo. Sept. 18, 1985), *appeal pending*, No. 85-2428 (10th Cir.).

²⁷ 42 U.S.C. § 7181(b)(3) (1977).

²⁸ See, e.g., GAO Letter, *supra* note 24.

²⁹ See 132 CONG. REC. S10131 (daily ed. August 1, 1986) (debt ceiling legislation); *id.* at S11089 (daily ed. August 9, 1986) (Senate adopts debt ceiling legislation).

resolution (No. 699) disavowing the criteria.³⁰ At hearings on the latter, all non-government witnesses supported disapproval of the new contract criteria: the nuclear utility industry disapproved because it believed the criteria charged it with unwarranted costs;³¹ the National Taxpayers' Union objected because it believed that the criteria failed to charge utilities enough;³² and the domestic uranium industry withheld endorsement because it believed that numerous features in the criteria are detrimentally impacting its viability.³³ The two House Committees, to which the joint resolution was referred, voted to report it favorably.³⁴ However, in the waning hours of the 99th Congress, this action was not linked to the Senate's separate effort in the debt ceiling area. The Appropriations Committees adopted language in the continuing resolution withdrawing funds for certain aspects of the new criteria.³⁵ Although DOE has urged that these events be deemed to suggest a general congressional intent to approve its actions, the situation seems far too complex to infer congressional ratification.

"This is the most confusing mess I've ever seen," observed one fuel broker.³⁷ Certainly the market and the situation are confused, and that confusion is multi-layered. There is confusion as to what is going on and why; confusion as to how the law applies to whatever the facts turn out to be; and confusion as to whether to change the law if it is applied in a fashion so as to obstruct what DOE is, or is not, currently doing. In short, there is confusion as to fact, law and policy.

The need to reach an understanding is great. DOE argues that if it sets prices at a level sufficient to recover the amounts calculated by GAO, the enrichment program would be non-

³⁰ H.R. J. Res. 699, 99th Cong., 2d Sess., 132 CONG. REC. H5697 (daily ed. August 1986).

³¹ *Hearing Before the Subcomm. on Energy and Environment of the House Comm. on Interior & Insular Affairs*, 99th Cong., 2d Sess. (1986) (statement of Loring Mills, Edison Electric Institute at 1-7).

³² *Id.* (statement of B. Jeanine Hall, National Taxpayers Union).

³³ *Id.* (statement of Edward R. Farley, Uranium Producers of America).

³⁴ See 123 CONG. REC. H8619 (daily ed. Sept. 29, 1986), *announcing* H. Rept. 99-926, pt. 1.

³⁵ See 123 CONG. REC. H10844-45 (daily ed. Oct. 15, 1986) (conf. report).

³⁶ See 123 CONG. REC. H10906 (daily ed. Oct. 15 1986) (statement by Mr. Conte); 123 CONG. REC. S16636 (daily ed. Oct. 16, 1986) (Domenici/Helms colloquy).

³⁷ *Doubts Pervade Nuclear Fuel Industry*, Wall St. J., Oct. 7, 1985, at 6, col. 1.

competitive.³⁸ If this is true, the agency would lose customers, thus sustaining further losses, and the United States could become dependent on foreign sources for enriched nuclear fuel.

“The root of the enrichment program’s crisis,” states Science magazine, “is a series of decisions made a decade ago that [seemed] logical at the time but with hindsight proved disastrous.”³⁹ The initial step in understanding this “mess” is to explore the history of how and why DOE got where it is today.

II. THE RISE AND FALL OF DOE’S ENRICHMENT MONOPOLY

A. *The Federal Monopoly on Nuclear Fuel*

The nuclear industry effectively came into being with the Manhattan Project, conducted under the auspices of the United States Army’s Manhattan Engineer District [hereinafter MED] during World War II.⁴⁰ A total of nearly 150,000 workers engaged in different aspects of the enterprise. Exempt from congressional management, MED’s cost totaled an estimated \$2 billion.⁴¹ Among other things, MED sought out sources of uranium and constructed the first significant uranium enrichment facility — the gaseous diffusion plant at Oak Ridge, Tennessee — to enrich uranium for military purposes.⁴² There were no other enrichment facilities at that time. The federal government thus enjoyed an absolute monopoly with respect to uranium enrichment and nuclear fuel.

The federal monopoly was carried forward by the Atomic Energy Act of 1946.⁴³ This new statute established the Atomic

³⁸ See, e.g., Statement of John R. Longenecker, Deputy Assistant Secretary for Uranium Enrichment, before the Energy and Env. Subcomm. of the Interior and Insular Affairs Comm., Oct. 22, 1985, at p.4:

[t]he key to success of the U.S. uranium enrichment enterprise is to get near-term prices down to the competitive range through the timely introduction of advanced technology. The market is extremely price sensitive and thus a crucial part of our competitive strategy is our approach to pricing. Our prices simply must be more competitive.

³⁹ *Radical Surgery*, *supra* note 10, at 1407; A Competitor’s View, *supra* note 10, at 1.

⁴⁰ See, e.g., B. GOLDSCHMIDT, *THE ATOMIC COMPLEX: A WORLDWIDE POLITICAL HISTORY OF NUCLEAR ENERGY* (Amer. ed. 1982); I R. HEWLETT & O. ANDERSON, *THE NEW WORLD: A HISTORY OF THE UNITED STATES ATOMIC ENERGY COMMISSION 1939-1946* (1972).

⁴¹ B. GOLDSCHMIDT, *supra* note 40, at 54. This is roughly 10 billion in current dollars.

⁴² *Id.* at 55.

⁴³ 60 Stat. 755.

Energy Commission (AEC) which was encharged with all functions of the MED⁴⁴ as well as oversight of both civilian and military uses of atomic energy. Although Congress predicted a potentially important future for civilian uses of nuclear energy, the 1946 Act provided for tight federal control of nuclear fuel. In particular, the 1946 Act prohibited private ownership of enriched uranium,⁴⁵ termed "fissionable material."⁴⁶ Private parties seeking to employ enriched material for peaceful purposes, such as for generation of electrical power, were required to lease it from the AEC. As a result, the Commission was the sole purchaser of uranium from the mining industry.⁴⁷ The regime was carried forward with the Atomic Energy Act of 1954.⁴⁸

B. The Private Ownership of Special Nuclear Materials Act

The AEC was concerned with the budget implications of continued government ownership of all enriched nuclear fuels. The agency feared that government ownership would lead to an increasingly onerous federal investment in the fuel used by domestic and foreign utilities. Driven by this and other factors,⁴⁹ in March, 1963, the AEC proposed legislation to eliminate the statutory requirement for mandatory government ownership of all "special nuclear material" (the term employed in the 1954 Act for enriched uranium) and to permit private ownership instead.⁵⁰ The proposed legislation envisioned the Commission

⁴⁴ See R. HEWLETT & O. ANDERSON, *supra* note 40, at 620.

⁴⁵ See Section 5(a)(2) of the AEA of 1946, *supra* note 4.

⁴⁶ See Section 5(a)(1) of the AEA of 1946, *supra* note 4.

⁴⁷ See generally AEC, *Statement on Uranium Supply Policies and Related Activities* (1968), reprinted in *Status of the Domestic Uranium Mining and Milling Industry: The Effects of Imports: Hearing Before the Energy Res. and Dev. Subcomm. of the Senate Energy and Nat. Res. Comm.*, 97th Cong., 1st Sess. 405 (1981) [hereinafter 1981 Hearings].

⁴⁸ 42 U.S.C. § 2011 (1954). Section 52 of the AEA of 1954, 68 Stat. 929-30, prohibited private ownership of "special nuclear material."

⁴⁹ For example, AEC also felt that private ownership would provide greater assurance to domestic and foreign utilities and thus encourage the development of atomic energy. See *Private Ownership of Special Nuclear Materials: Hearings Before the Subcomm. on Legislation of the Jt. Comm. on Atomic Energy*, 88th Cong., 1st Sess. 4 (1963) [hereinafter 1963 Hearings].

⁵⁰ Letter from Leland J. Haworth (AEC) to Lyndon B. Johnson (Pres. of the Senate) (March 15, 1963), reprinted in 1963 Hearings, *supra* note 49, at 187 and *Private Ownership of Special Nuclear Materials, 1964: Hearings Before the Subcomm. on Legislation of the Jt. Comm. on Atomic Energy*, 88th Cong., 2d Sess. 343 (1964) [hereinafter 1964 Hearings].

entering into agreements for the enrichment of uranium, termed toll enrichment, but contained a number of limitations on this projected new authority. The most significant economic constraint rendered the requirements of Section 161m. of the AEA applicable to the AEC's sales of full enrichment. Section 161m. provided (and still provides) that prices for Commission materials and services "shall be established on such a nondiscriminatory basis as, in the opinion of the Commission, will provide reasonable compensation to the Government for such material or services and will not discourage the development of sources of supply independent of the Commission."⁵¹ The Commission's bill also required the AEC to establish "criteria" for pricing special nuclear material, and further required those prices to be "reasonable."⁵² However, this provision did not apply to toll enrichment.

The initial hearing in 1963 "identified a number of important policy questions."⁵³ The key question for our purposes was an issue which spawned a major portion of Section 161v., which on its face would seem to have little to do with the basis for providing toll enrichment services. That question was: "Shall some restrictions be imposed on the importation of foreign uranium concentrates for enrichment and sale on the domestic market?"⁵⁴

At the time Congress was considering private ownership of enriched nuclear fuel, the AEC was the only significant buyer of uranium in the Free World. The Commission had accumulated a stockpile of uranium ore which was (and apparently still is) more than adequate to meet U.S. military requirements.⁵⁵

⁵¹ 1964 Hearings, *supra* note 50, at 351-52.

⁵² *Id.* at 355.

⁵³ *Id.* at 1.

⁵⁴ *Id.*

⁵⁵ During and immediately after WW II, the United States was dependent largely on a Canadian radium mine in the Arctic Circle and on the Shinkolobwe mine in what was then the Belgian Congo (now Zaire) for its uranium supplies. Authorities labored under the assumption that commercial deposits of uranium were not plentiful. One of the AEC's initial actions was to embark on a program to develop supplies of uranium in the United States and overseas, particularly Canada and South Africa. The Commission in essence created the Canadian and South African uranium industries, procuring in excess of 100,000,000 pounds of uranium from these two countries by the early 1960s. See T. NEFF, *THE INTERNATIONAL URANIUM MARKET* 145 (Canada) & at 174-75 (South Africa) (1984); YOKELL & DE SALVO, *The Uranium Default: Westinghouse and the Utilities*, PUB. UTIL. FORT., Feb. 7, 1985 at 20, 23.

The AEC was interested in bringing its costly uranium procurement effort to a close, but without loss of the domestic uranium industry, which was viewed as important both for defense purposes and as an assured source of supply for the budding civilian nuclear power industry. Domestic uranium producers were concerned about possible unfair foreign trade practices, such as dumping foreign uranium on the U.S. market at prices with which domestic producers could not compete.⁵⁶ Some domestic producers also professed concern regarding possible insufficient demand from nuclear utilities to sustain a viable domestic uranium industry against low-cost foreign producers regardless of unfair trade practices.⁵⁷ With the exception of domestic producers holding foreign uranium reserves,⁵⁸ the domestic uranium industry and its supporters in the powerful Joint Committee on Atomic Energy called for an exclusion of foreign-source uranium from the domestic market.⁵⁹ They argued that dependence on foreign supplies "would be contrary to the essential security interests of the United States."⁶⁰

Responding to this concern, the Commission offered to bar enrichment of foreign uranium intended for domestic end-use until 1975, evidently as a function of the agency's general authority to regulate the nuclear industry to assure the common defense and security⁶¹ and to maximize national welfare.⁶² The 1975 sunset was chosen because the Commission projected that the domestic demand for uranium would then be large enough

Offering price guarantees, free technology, and other inducements, the Commission's domestic program was so successful that uranium discoveries by the mid-1950's were sufficient to meet all U.S. military needs independent of the foreign supplies which had been procured. See generally AEC, Statement on Uranium Supply Policies and Related Activities, *supra* note 47.

⁵⁶ See 1963 Hearings, *supra* note 49, at 114-15.

⁵⁷ See, e.g., 1964 Hearings, *supra* note 50, at 154 (testimony of Dean McGee alluding to low-cost Canadian reserves and South African production as a by-product of gold mining).

⁵⁸ *Id.* at 206 (testimony of the President of Western Nuclear, Inc.).

⁵⁹ See, e.g., 1963 Hearings, *supra* note 49, at 115 (discussion of whether to prohibit enrichment of foreign source uranium for domestic end-use).

⁶⁰ See, e.g., 1964 Hearings, *supra* note 50, at 154 (testimony by the President of Kerr-McGee Oil Industries). The AEC agreed that "it [is] essential that [the domestic uranium] industry be maintained viable . . ." *Id.* at 4. See also *id.* at 427 (remarks of Congressman Hosmer).

⁶¹ See, e.g., 42 U.S.C. § 2201(b) (1973).

⁶² Compare 42 U.S.C. § 2013(c) (1973) with 42 U.S.C. § 2201(p) (1973) (authority to issue rules to carry out any purpose of the chapter).

to sustain a viable domestic uranium industry in the face of foreign competition.⁶³ Uranium producers, however, speaking through Dean McGee, the Chairman of the Kerr-McGee Corporation, called for specific legislation to "postpon[e] the enrichment in Government plants of foreign uranium for domestic use."⁶⁴ Representative Holifield, the Vice-Chairman of the Joint Committee, accordingly invited Mr. McGee to suggest an appropriate amendment.⁶⁵ McGee proposed several amendments. The most significant was to "empower" the Commission to "protect against . . . toll enrichment in Government facilities of uranium of foreign origin for domestic end-use."⁶⁶ This amendment, cast in the form of a proviso to Section 161m. of the Atomic Energy Act, required the AEC to

establish criteria in writing setting forth the terms and conditions of making such production or enrichment services available and in this regard, shall not extend its services to source or special nuclear materials of foreign origin intended for domestic use to the extent necessary to assure the development of a viable domestic uranium mining and milling industry: *And provided further*, that before the Commission establishes such criteria, the criteria shall be submitted to the Joint Committee, and a period of forty-five days shall elapse while Congress is in session (in computing such forty five days there shall be excluded the days in which either House is not in session because of adjournment for more than three days) unless the Joint Committee by resolution waives the conditions of, or all or any portion of, such forty-five day period.⁶⁷

⁶³ In the words of the Commission:

In the early years, it is the Commission's intent not to toll enrich uranium of foreign origin, except where the enriched product is to be re-exported for foreign consumption. This restriction would be removed July 1, 1975, when civilian requirements are expected to be sufficiently high that the viability of the domestic industry would no longer be at stake.

1964 Hearing, *supra* note 50, at 5. Dr. Seaborg subsequently testified that AEC expected domestic civilian demand to reach about 8,000 tons per year (the level of U.S. government procurement for the latter portion of the 1960's) by 1975. *Id.* at 16-17.

⁶⁴ Mr. McGee explained that "[a]lthough we have full confidence in the present Commission, such a statement of the Commission's present intent is not a sufficient basis on which the domestic industry can make the long-term commitments required for an adequate program of exploration and development of new reserves." *Id.* at 155.

⁶⁵ *Id.* at 195-96.

⁶⁶ *Id.* at 197.

⁶⁷ *Id.* at 198. There is some question as to why the AEC and uranium producers advocated protection of the domestic uranium industry through limitations on AEC toll

When the Joint Committee reported the Private Ownership of Special Nuclear Material Act, the legislation contained a new Section 161v. governing toll enrichment services. As reported by the Joint Committee, Section 161v. specifically authorized the Commission to enter into contracts to provide, after December 31, 1968, "for the producing or enriching of special nuclear material in facilities owned by the Commission" for both domestic and foreign customers, subject to the following proviso:

That (i) prices for services [rendered domestic customers] shall be established on a non-discriminatory basis; (ii) prices for services [rendered foreign customers] shall be no less than prices [charged domestic customers]; and (iii) prices shall be established on a basis which will provide reasonable compensation to the Government: *And provided further*, that the Commission, to the extent necessary to assure the maintenance of a viable domestic uranium industry, shall not offer such

enrichment services. A possible reason for this approach appears to be that, although foreign uranium producers were uncomfortable with it, it was viewed as arguably consistent with U.S. obligations under the General Agreement on Tariffs and Trade (GATT), whereas a quota or a tariff might violate GATT, absent invocation of the national security exception under Article XXI. See S. CONG. REP. No. 1325, 88th Cong., 2d Sess., *reprinted in 1964 U.S. CODE CONG. & ADMIN. NEWS* 3105, 3121 ("The committee believes that these reasonable and flexible restrictions on the performance of services by the Commission should not in any sense be deemed inconsistent with any obligations the United States may have under . . . (GATT) and other international trade agreements."); see also Letter from Mr. Yeutter to Mr. Udall (July 15, 1985) (enrichment limitation does not infringe GATT because it is a condition under which U.S. Government renders a service). *But see* Letter from Alexis Johnson (State Dept.) to Glenn Seaborg (AEC) (June 8, 1964) *reprinted in 1964 Hearings, supra* note 50, at 409-11 (suggesting that enrichment limitation may violate "either or both" of U.S. trade policies to reduce trade barriers or GATT).

The approach suggested by Mr. McGee had a potential weakness from the point of view of domestic uranium producers. That weakness was that an AEC enrichment limitation could theoretically be circumvented in at least two ways. First, if the AEC's enrichment plants were privatized, the limitation would lapse. Second, domestic utilities might import enriched uranium of foreign origin. Mr. McGee in fact recognized these problems, 1964 Hearings, *supra* note 50, at 155-56, and suggested that the legislation also include language specifically authorizing the Commission to regulate in a fashion so as to prevent these problems. *Id.* at 198. These suggestions were not adopted by the Joint Committee, evidently in part because the AEC took the position that it implicitly had such authority without the additional language. See 1963 Hearings, *supra* note 49, at 29-30 (AEC asserts that it has authority to regulate importation of enriched uranium so as to assure the maintenance of a viable domestic uranium industry by imposing conditions on licenses required to import and to possess such material under the Atomic Energy Act); *Proposed Modification of Restrictions on Enrichment of Foreign Uranium for Domestic Use: Hearings Before the Joint Comm. on Atomic Energy*, 93d Cong., 2d Sess. 8, 233 (1974) [hereinafter 1974 Hearings].

services for source or special nuclear materials of foreign origin intended for use in a utilization facility within or under the jurisdiction of the United States. The Commission shall establish criteria in writing setting forth the terms and conditions under which services provided under this subsection shall be made available including the extent to which such services will be made available for source or special nuclear material of foreign origin intended for use in a [reactor] within or under the jurisdiction of the United States: *Provided*, that before the Commission establishes such criteria, the proposed criteria shall be submitted to the Joint Committee, and a period of forty-five days shall elapse which Congress is in session (in computing the forty-five days there shall be excluded the days in which either House is not in session because of adjournment for more than three days) unless the Joint Committee by resolution in writing waives the conditions of, or all or any portion of, such forty-five day period.⁶⁸

The new provision carried forward the requirement, which the AEC proposed for Section 161m. of the AEA, that the price for toll enrichment be reasonable and non-discriminatory. The new provision, however, did not contain the restriction in Section 161m. that the price for such services should not discourage the development of independent sources of supply. This omission suggested that profit-taking or price gouging was to be avoided in the enrichment area. The legislative history states that the charge for toll enrichment is to be "based generally upon the cost of doing necessary processing . . . in the Government's different plants."⁶⁹ The Joint Committee indicated that the "reasonable compensation" standard contained some flexibility, but described this as flexibility in a particular direction: namely, to permit the Commission not to charge initially for enrichment plant capacity constructed for military purposes and not used for civilian enrichment. In justification of this flexibility, the Committee noted that there was a "national interest in the development and utilization of nuclear power."⁷⁰

The new Section 161v. also incorporated without substantial change the proposals of the uranium producers that: (a) the government issue written criteria, subject to prior 45-day review

⁶⁸ 42 U.S.C. § 2201 (1973).

⁶⁹ S. CON. REP. No. 1325, 88th Cong., 2d Sess. 2 (1964).

⁷⁰ *Id.* at 17-18.

before the Joint Committee, to govern the provision of enrichment services; and (b) federal enrichment of foreign-source uranium for domestic end-use be limited "to the extent necessary to assure the maintenance of a viable domestic uranium industry."⁷¹

C. *The 1966 Criteria and Requirements Contracts*

The Commission proposed initial criteria in 1966 to implement the Private Ownership of Special Nuclear Material Act (and particularly Section 161v.).⁷² These initial criteria, adopted largely as proposed,⁷³ are important for a variety of reasons. Most significant for purposes here, the criteria set forth the initial understanding of AEC concerning the statutory requirement that it charge "reasonable compensation" for enrichment services to the government.⁷⁴ Both the proposed and final criteria

⁷¹ AEC's initial criteria barred enrichment of foreign source uranium for domestic end use. 31 Fed. Reg. 16479 (1966). Based on optimistic forecasts of expanding demand for nuclear power and, consequently, uranium (see AEC, *THE NUCLEAR INDUSTRY 1* (1973); *Proposed Changes in AEC Contract Arrangements for Uranium Enriching Services: Hearings Before the Subcomm. on Energy of the Joint Comm. on Atomic Energy*, 93d Cong., 1st Sess. 7 (1973) [hereinafter 1973 Hearings]; *Uranium Enrichment: Hearing for the Abyss*, 221 SCIENCE 730 (1983); Letter from J. Peach (GAO) to Rep. Ottinger (26 Jan. 1984)), the AEC in 1974 adopted new criteria phasing out the limitations during the period 1978-83. As noted, the optimistic projections did not come to pass. The domestic uranium industry began to appeal for relief in 1981. See 1981 Hearings, *supra* note 47.

Despite several requests from domestic producers to reimpose enrichment limitations under section 161v., the Department of Energy (now in charge of implementation of section 161v) has declined. At first, the principal grounds for refusal was simply the domestic uranium industry was "viable." However, as of September 26, 1985, DOE declared that the domestic uranium industry was in fact not viable in calendar year 1984. See *Hearing Before the Energy Cons. & Power Subcomm. of House Energy & Comm.*, 99th Cong., 1st Sess. (1985) (testimony of Edward J. Hanrahan, DOE). DOE nevertheless has declined to reimplement section 161v. See, e.g., Hanrahan, *supra*. One of the rationales offered by DOE for its refusal to act is that reimposition of enrichment limitations would be circumvented in that utilities would go abroad for enrichment services. The federal government now takes the position that it lacks authority under the Atomic Energy Act to prevent this kind of circumvention through the licensing process. See Memorandum in Support of Defendants' Motion for Judgment on the Pleadings and Motion for Summary Judgment and in Opposition to Plaintiffs' Motion for Summary Judgment, *Western Nuclear v. Huffman*, No. 84-C-2315 (D. Colo. Sept. 30, 1985) (defendants argue that NRC, to which licensing authority was transferred under the Energy Reorganization Act of 1974, "has no authority to regulate import licenses to preserve the [uranium] industry's economic health"). But see 42 U.S.C. § 2201(b) & (p) (1954).

⁷² *Uranium Enrichment Services Criteria and Related Matters: Hearings Before the Joint Committee on Atomic Energy*, 98th Cong., 2d Sess. 285 (1966) (proposed criteria, June 29, 1966) [hereinafter 1966 Hearings].

⁷³ 31 Fed. Reg. 16479 (Dec. 23, 1966); 1966 Hearings, *supra* note 72, at 520.

⁷⁴ 42 U.S.C. § 2201 (1973).

explain that: "The Act requires that [enrichment] charges provide reasonable compensation to the Government. AEC's charge for enriching services will be established on a basis that will assure the recovery of appropriate Government costs projected over a reasonable time."⁷⁵ As stated, there is some ambiguity, in that the sentence speaks in terms of "appropriate" government costs. But the criteria later spell out in detail what costs are "appropriate:"

[t]he cost of [enrichment] includes electric power and all other costs, direct and indirect, of operating the gaseous diffusion plants; appropriate depreciation of said plants; and a factor to cover applicable costs of process development, AEC administration and other Government support functions, and imputed interest on investment in plant and working capital. During the early period of growth of nuclear power, there will be only a small civilian demand on the large AEC diffusion plants. These plants were originally constructed for national security purposes, but will be utilized in meeting future civilian requirements. In this interim period of low plant utilization, the Commission has determined that the costs to be charged to [enrichment services] produced for civilian customers will exclude a portion of the costs attributable to depreciation and interest in plant investment which are properly allocable to plant in standby and to excess capacity.⁷⁶

The basis for this approach was clearly identified to the Joint Committee by Mr. Abbadessa, the AEC's Comptroller. Mr. Abbadessa explained that the Commission intended a "full-cost charge to the toll-enrichment program." Mr. Abbadessa stated that the AEC believed that such a charge was "consistent with the legislative history." This charge would include direct costs, overhead, depreciation and interest on the Government's investment. However, it would not include depreciation and imputed interest on "costs associated with unused capacity in [enrichment] plants which were built essentially for military purposes." Those costs were to be charged "to national defense."⁷⁷ Noting

⁷⁵ 1966 Hearings, *supra* note 72, at 287 (proposed) & 522 (final).

⁷⁶ *Id.* at 287-88 (proposed) & 522 (final). The criteria also indicated that imputed interest on so-called pre-produced uranium (uranium enriched from the government stockpile in advance of actual need) "will be factored into the [enrichment services] charges." *Id.* at 288 (proposed) & 522 (final).

⁷⁷ *Id.* at 31.

that "if the plant were built today it would necessarily have some excess capacity," Mr. Abbadessa was asked why AEC was not charging at least some of its costs associated with excess capacity to enrichment customers. In response, Mr. Abbadessa explained that the Commission intended to charge depreciation and imputed interest on the entire enrichment investment once actual utilization of the plants reached 75%. Mr. Abbadessa explained that it was not reasonable to expect private industry to build a plant with more than 25% excess capacity and recover all the costs of such capacity from its customers.⁷⁸

Mr. Conway, Executive Director for the Joint Committee, nevertheless objected to AEC's failure to include some costs for excess capacity when plant utilization fell below 75%.⁷⁹ Mr. Conway's concerns were addressed in an exchange of letters between the Joint Committee and the AEC. The letters embodied a careful and precise interpretation of the criteria. Under this interpretation, a portion of costs attributable to depreciation and interest on plant investment associated with unused capacity would continue to be charged to national defense. However, the AEC would recover depreciation and interest costs on that percentage of plant production capacity used, plus 10%, but with a floor of no less than 30%. Once plant use reached 75%, 100% of depreciation and interest costs were recoverable.⁸⁰ This construction of the criteria and the agreement it embodied with the Joint Committee became known as the "Conway Formula."

Another feature of the criteria, later to be of some controversy, was the provision for a guaranteed ceiling price of \$30 per kilogram unit of "separative work" ("SWU") for separation of U-235 from U-238. The ceiling price, however, was subject to upward escalation for the cost of electric power and labor,⁸¹ and this was viewed as sufficient to assure full cost recovery⁸² over the expected thirty year term of some of the contracts.⁸³

The guiding principle of the 1966 criteria was flexibility. The

⁷⁸ *Id.* at 32.

⁷⁹ *See, e.g., id.* at 62.

⁸⁰ Letter from Chairman Holifield (Jt. Comm. on Atomic Energy) to Dr. Seaborg (Chairman, AEC) (Oct. 18, 1966); Letter from Dr. Seaborg to Chairman Holifield (Dec. 16, 1966) (both letters are reprinted in the 1966 Hearings, *supra* note 72, at 517-19). This formula is known as Conway Excess Capacity Formula or Conway Formula.

⁸¹ 1966 Hearings, *supra* note 72, at 522.

⁸² *Id.* at 319 (projected full cost over period 1969-75 would be below \$30 ceiling).

⁸³ *Id.* at 34 (escalation would provide protection over a 30 year period).

criteria envisioned two types of AEC contracts, or some combination thereof. The two types were the "firm quantities" and the "requirements contract." In the firm quantities regime, AEC would agree to deliver and the customer to take specified amounts of enrichment services on a specified schedule for the agreed term of the contract. Under the requirements contract, the AEC would agree to provide up to a specified amount of enrichment services for a specified reactor or group of reactors. The customer would then agree not to rely on alternative sources for these requirements, but the customer would not be obligated to take any minimum amount of services, even if there were schedule delays, unexpected outages or other unforeseen problems.⁸⁴ As expected,⁸⁵ most of AEC's customers chose the requirements contract format, because it allowed maximum flexibility for the enrichment customer in arranging fuel deliveries.

AEC announced a \$26 uranium enrichment services price on September 19, 1967.⁸⁶ The GAO, pursuant to the Joint Committee's requirement, reviewed this price and found it consistent with the 1966 criteria. The Joint Committee specifically asked whether the charge constituted a subsidy, (GAO indicated that it did not), assuming utilization of federal enrichment facilities as expected by the AEC.⁸⁷

In November of 1969, President Nixon asked the AEC to operate its enrichment facilities as a separate organizational entity within the Commission and in a fashion resembling a commercial enterprise. The President hoped that this would facilitate sale of the facilities to the private sector.⁸⁸ The AEC, Commissioner Ramey dissenting, responded to President Nixon's request

⁸⁴ *Id.* at 4-5, 7-8 (The Commission's proposed contracts, dated July 1, 1966, are published in the 1966 Hearings at 290-313.).

⁸⁵ The AEC testified that "a variant of [the requirements] form of contract . . . was initially used by AEC as a promotional aid to encourage construction of nuclear power reactors abroad. While uncertainties as to the operability of power reactors have largely been resolved, there remain questions as to the technology, capacity factor versus time, and economic life. Because of these uncertainties, we believe that the reactor operation contracting on a long term basis will find considerable advantage in a contract that provides these types of flexibility as to his fuel needs." *Id.* at 11-12. Had the Government retained the requirements contract approach, the problems of surplus inventories and competition from the secondary market which had so devastating an effect in the early and mid-1980's would never have arisen.

⁸⁶ *Uranium Enrichment Pricing Criteria: Hearings Before the Joint Comm. on Atomic Energy*, 91st Cong., 2d Sess. 104 (1970) [hereinafter 1970 Hearings].

⁸⁷ *Id.* at 135-36.

⁸⁸ *Id.* at 7.

with a proposal to base its toll enrichment prices on the needs, including profit, of a hypothetical private corporation rather than on a cost recovery standard.⁸⁹ The Joint Committee solicited a legal opinion from GAO concerning the validity of the proposed revisions to the 1966 pricing criteria.⁹⁰ GAO concluded that the proposed criteria change was not consistent with the intent of Congress.⁹¹ The GAO opinion stated that “reasonable compensation” under Section 161v. meant full cost recovery and not elicitation of a profit.⁹²

Congress reacted to AEC’s attempt to revise the 1966 pricing criteria with an amendment to Section 161v. The amendment changed the statutory basis of pricing under the toll enrichment program from “reasonable compensation” to the current phrase “recovery of the Government’s costs over a reasonable period of time.”⁹³ In so doing, the Joint Committee explicitly affirmed GAO’s legal opinion. The Committee stressed that it expected “this reiteration of congressional intent [to] preclude any further attempt to deviate from the purpose of the statute.”⁹⁴

D. The Glory Years, the 1973 Criteria and the Fixed Commitment Contract

The early 1970’s were heady days for nuclear power. Fueled by Project Independence,⁹⁵ oil embargoes,⁹⁶ uncertainties over use of coal due to environmental concerns,⁹⁷ steadily rising demand for electricity⁹⁸ and the implicit assumption that nuclear

⁸⁹ *Id.* at 3.

⁹⁰ *Id.* at 160.

⁹¹ *Id.* at 176.

⁹² The GAO opinion acknowledged some flexibility to disregard certain costs due to overcapacity resulting from cutbacks in military enrichment requirements to the extent that inclusion of the cost would cause enrichment prices “to increase so significantly that the development of atomic power would be impeded.” 1970 Hearings, *supra* note 86, at 172-73. In GAO’s view, the only flexibility to full cost recovery requirement was in terms of the problem addressed by the Conway Formula.

⁹³ 42 U.S.C. § 2051 (1973).

⁹⁴ H.R. REP. NO. 1470, 91st Cong., 2d Sess. 25 (1970); S. REP. NO. 1247, 91st Cong., 2d Sess. 25 (1970).

⁹⁵ FEDERAL ENERGY ADMINISTRATION, PROJECT INDEPENDENCE REPORT (1974) (President Nixon’s plan for important reliance on nuclear power).

⁹⁶ AEC, THE NUCLEAR INDUSTRY 1-2 (1973).

⁹⁷ *Id.*

⁹⁸ Cook, *Nuclear Follies*, FORBES, Feb. 11, 1985, at 82, 88 (7 percent annual growth projected).

technology was sufficiently developed and stabilized to support heavy investment commitments,⁹⁹ the AEC projected significant U.S. reliance on nuclear-generated electricity. AEC testified in 1973 that "U.S. nuclear generating capacity will grow to 1,200,000 megawatts by the year 2000"¹⁰⁰ and that nuclear power would fill sixty percent of U.S. needs.¹⁰¹ AEC also projected that nuclear capacity in other Free World nations would grow to 1,460,000 megawatts by the turn of the century.¹⁰²

Such an eighty-fold expansion in nuclear generating capacity obviously would require an expansion in facilities to enrich uranium. AEC testified concerning the need for as many as 11 new enrichment plants of a size equal to the average size of the three existing plants.¹⁰³ Indeed, the agency foresaw a need for six new enrichment plants by 1985.¹⁰⁴ At an estimated \$1.5 billion per plant, the total enrichment investment over the next ten years would be roughly \$9.0 billion, exclusive of additional capital costs associated with supplying electricity to the plants.¹⁰⁵

To begin to address this projected explosive growth in demand for enrichment capacity, AEC initiated a billion dollar plus program to increase the capacity at its three existing diffusion plants from roughly 17,000,000 SWU's per year to 27,000,000 SWU's.¹⁰⁶ However, the agency professed reluctance to assume the burden of constructing new enrichment plants. "It is our belief," the agency declared, "that U.S. private industry can and should assume responsibility for the additional plants needed to meet this vast increase in demand for enrichment services and therefore, the Commission does not intend to build additional enrichment plants."¹⁰⁷

In order "to assist and encourage the participation by private industry in the supply of enrichment services," the AEC on January 18, 1973 proposed a number of revisions to the existing enrichment criteria, as well as a new form of enrichment contract

⁹⁹ *Id.* at 84 ("The assumption was you had a mature technology when in fact it was still evolving.").

¹⁰⁰ 1973 Hearings, *supra* note 71, at 7.

¹⁰¹ *Id.*

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Id.* at 9.

¹⁰⁵ *Id.*

¹⁰⁶ 1973 Hearings, *supra* note 71, at 9, 325.

¹⁰⁷ *Id.* at 9.

— the “long term Fixed Commitment Contract [hereinafter LTFC contract].”¹⁰⁸ The proposed new criteria and LTFC contract constituted what became a debilitating blunder on the part of federal enrichment authorities.

AEC estimated that a lead time of approximately eight years was required to construct new enrichment plants.¹⁰⁹ Under the LTFC contract the agency accordingly proposed to require that customers contract eight years in advance of their needs.¹¹⁰ Customers were also required to make firm commitments to procure the enrichment needed for a particular size (in electrical megawatts) of reactor.¹¹¹ After the power plant had actually been purchased, the customers were required to specify in SWU’s the enrichment services required for a rolling 10 year period forward.¹¹² The Commission proposed to allow customers to delay their commitments only with respect to reloads in the event of schedule delays in completing construction of a reactor.¹¹³ AEC also withdrew its commitment to maintain its prices below a stated ceiling. The Commission explained that its price would be cost-based. It argued that electricity and labor costs were no longer classified so that utilities could review them and thus did not require the assurance of a ceiling. The Commission noted that capital costs for new plants were unpredictable and, consequently, it could not state a ceiling price applicable to that area.¹¹⁴

The Joint Committee criticized the AEC’s proposed criteria revision because the proposals vested excessive discretion in the Commission and circumvented the Congressional intent requiring criteria. Senator Jackson, for example, charged that “the revised criteria omit any reference to the types and significant details of the contracts under which enrichment services will be provided.”¹¹⁵ Additionally, Congressman Price stated:

[s]ince the significant features of the new types of contracts are not described in the criteria there appears to be nothing

¹⁰⁸ *Id.* at 267, 293.

¹⁰⁹ *Id.* at 24.

¹¹⁰ *Id.* at 17, 23.

¹¹¹ *Id.* at 24.

¹¹² 1973 Hearings, *supra* note 71, at 25-26.

¹¹³ *Id.* at 26.

¹¹⁴ *Id.* at 21.

¹¹⁵ *Id.* at 2.

that would require the Commission to return to the Joint Committee should it decide to vary the terms and conditions under which it would provide the uranium enrichment services. This seems to be a substantial departure from the intent of Section 161v.¹¹⁶

Chairman Holifield was of a similar view.¹¹⁷

Although the Joint Committee ultimately accepted AEC's LTFC approach, it nevertheless forced a number of changes in the revised criteria. Those revisions cast the LTFC approach as a requirement in the final criteria, with the effect of significantly limiting the Commission's discretion.¹¹⁸ For example, one of the changes was a specific statement to the effect that the "primary contracting vehicle" would be the Fixed Commitment Contract,¹¹⁹ a copy of which had been furnished the Joint Committee.¹²⁰

On September 11, 1973, the AEC published a notice requiring potential customers, who needed first loads of enriched fuel before July 1, 1978, to contract before December 31, 1973, and requiring those customers needing first loads between July 1, 1978 and June 30, 1982 to contract before July 30, 1974.¹²¹ The Commission in essence refused to contract with customers who did not anticipate initial loading before July 1982.¹²² The Commission subsequently suspended entering into new long term contracts, claiming that it was "contracted out."¹²³ These actions were in large part intended to create conditions under which alternative sources of enrichment would develop. The Joint Committee held hearings, expressing frustration that no progress was being made on constructing additional enrichment capacity and concern that "[t]his Nation cannot afford the catastrophe of a nuclear fuel gap."¹²⁴

¹¹⁶ *Id.* at 32.

¹¹⁷ *Id.* at 33, 34.

¹¹⁸ *Accord*, GAO Letter, *supra* note 24, at Appendix II.

¹¹⁹ 1973 Hearings, *supra* note 71, at 426.

¹²⁰ *Id.* at 695.

¹²¹ *Id.* at 698-99.

¹²² 1978 Hearings, *supra* note 10, at 175-76.

¹²³ See *Future Structure of the Uranium Enrichment Industry: Hearings Before the Joint Committee on Atomic Energy*, 93d Cong., 2d Sess. 3, 173 (1974) [hereinafter 1974 Hearings].

¹²⁴ *Id.* at 2.

E. Fall-out

The combination of the LTFC Contract and the energy supply hysteria which surrounded it had tragically destabilized the nuclear fuel industry. Utilities poured into the AEC to line up enrichment requirements. This behavior on the part of the utility industry was not irrational, because "[t]he cost of nuclear fuel compared to the size of investment in [a] reactor is very small, but that investment can be rendered useless if fuel is not there on time so reliability of supply is a very important element to the customers."¹²⁵ AEC's LTFC policies questioned the availability of fuel supplies for planned reactors. Utilities accordingly responded by lining up fuel supplies for their maximum possible projected reactor requirements.

By the end of June 1974, when it suspended further contracting, AEC had received requests for enrichment services for 257,000 megawatts of reactors. This amount was in addition to the agency's existing contracts to supply 107,000 megawatts worth of reactors under requirements contracts.¹²⁶ As AEC Chairman Ray testified, this explosion in demand "exceeded expectations and appears to reflect a growth in demand on a schedule that may exceed the present capability of industry and the utilities actually to bring nuclear power plants on line in the near term."¹²⁷

AEC's LTFC policy in fact created a massive artificial demand for enrichment services. In combination with several other factors, this in turn triggered a subsequent explosive growth in artificial demand for the uranium which the utilities were now committed to supply the federal government to enrich.¹²⁸ The previously depressed price for uranium soared. Foreign governments, prompted by AEC's contract cut-off, combined to begin construction of alternative enrichment facilities.¹²⁹ Frightened by the impending fuel crisis, and failing in its effort to stimulate private enrichment facilities, the federal government decided to

¹²⁵ Business Panel, *supra* note 2, at 47.

¹²⁶ 1978 Hearings, *supra* note 10, at 28.

¹²⁷ 1974 Hearings, *supra* note 67, at 517.

¹²⁸ See TAYLOR, HOW THE U.S. GOVERNMENT CREATED THE URANIUM CRISIS (AND THE COMING URANIUM BUST) (preliminary draft) (June 1977), reprinted in 1978 Hearings, *supra* note 10, at 143; see also Joskow, *Commercial Impossibility, the Uranium Market and the Westinghouse Case*, 6 J. OF LEGAL STUD. 119, 139-40 (1977); Comptroller General, *Certain Actions That Can Be Taken To Help Improve This Nation's Uranium Picture* 5 (1976) (EMD-76-1).

¹²⁹ 1978 Hearings, *supra* note 10, at 3, 12 (ERDA statement).

construct new enrichment capacity in 1975, and then began work on a 10 million SWU gas centrifuge facility at Portsmouth.¹³⁰ In order to alleviate the projected pressure on uranium supplies, heavy investments were made in breeder reactor research, including a demonstration facility, planned for Clinch River, Tennessee, which would rely on plutonium fuel.¹³¹

But the expected steady increase in demand for electricity and the projected explosive demand for nuclear power did not materialize. The rapid increases in the price of oil following the oil embargoes led to a period of stagnation and energy conservation which diminished the demand for electricity.¹³² Reactor orders were well below projections, dropping to only two for domestic use in 1978 and zero afterward.¹³³ Schedule delays and order cancellations became commonplace. The accident at Three Mile Island in March of 1979 sealed the near-term fate of the industry.¹³⁴ It is not certain whether any reactor ordered after 1974 will ever be operated in the United States.¹³⁵

F. *Mopping Up*

The denouement began relatively quickly but has only reached its current fevered pitch in the last several years. Virtually before the ink was dry on the new LTFC contracts, customers began to petition for "relief" in the form of cost-free adjustments or cancellation.

In 1975, the Energy Research and Development Administra-

¹³⁰ See *Uranium Enrichment*, *supra* note 71, at 731; see also *Radical Surgery*, *supra* note 10.

¹³¹ See H.R. REP. No. 91-1036, 91st Cong., 2d Sess. 2, 24 (1970). Congress abandoned the Clinch River Project in 1983 after the expenditure of more than \$1.5 billion. 129 CONG. REC. S14613-44 (daily ed. Oct. 26, 1983); *Breeder: After the Vote, What?*, NUCLEAR INDUSTRY (Nov. 11, 1983).

¹³² See Cook, *supra* note 98, at 88.

¹³³ See *Pulling the Nuclear Plug*, TIME, Feb. 13, 1984, at 34-35; see also Quirk & Terasawa, *Nuclear Regulation: An Historical Perspective*, 21 NAT. RES. J. 833, 836 (1981).

¹³⁴ See Cook, *supra* note 98, at 88.

¹³⁵ OFFICE OF TECHNOLOGY ASSESSMENT, NUCLEAR POWER IN AN AGE OF UNCERTAINTY (OTA - E 216, Feb. 1984) ("[n]o nuclear plant now operating or still under active construction has been ordered since 1974 and every year since then has seen a decrease in the total utility commitment to nuclear power"). Certainly the plethora of enrichment orders spawned by AEC's LTFC contract were out of touch with economic reality. The same could be said for the splurge of resources going into efforts to stimulate world-wide production of uranium.

tion [hereinafter ERDA] (AEC's successor) declared an "open season," during which customers could cancel contracts or adjust quantities or delivery schedules without charge.¹³⁶ However, the ability of ERDA customers to reduce their enrichment commitments to actual requirements was limited by a number of factors. ERDA, for example, stressed that the "open season" was a once-and-for-all offer and that further upward adjustments would not be allowed. Thus, customers continued to contract for their maximum possible requirements rather than their best estimates. In addition, initial core deliveries could not be deferred beyond fiscal year 1984. Other constraints were also imposed.¹³⁷ One expert estimated that "post-open season" enriched fuel requirements — as reflected in ERDA contracts — still exceeded by 30 to 50% what in retrospect were already overly optimistic expectations of nuclear fuel needs.¹³⁸

By 1977, pressure had again built for yet further changes to the Government's contracting policy. On June 15, 1977, ERDA wrote the Joint Committee, this time proposing changes to the basic enrichment criteria. ERDA postponed issuance of the criteria pending a hearing before the Senate Energy and Natural Resources Committee, the successor in the Senate to the Joint Committee.¹³⁹ During this delay, ERDA was folded into the DOE, and DOE prepared, in draft form, a new contract, denominated the Adjustable Fixed Commitment [hereinafter AFC] Contract.¹⁴⁰ The AFC contract contained a number of features intended to better fit actual enrichment needs to enrichment commitments. The lead-time for contract execution was cut from eight to six years and the firm commitment period was cut from 10 to 5 years. Certain additional flexibility was provided.¹⁴¹ At the hearing the AFC contract drew support from the utility community as a step toward correcting the wide imbalance be-

¹³⁶ See 1973 Hearings, *supra* note 69, at 806-07 (reprinting January 1975 announcement); 1978 Hearings, *supra* note 10, at 179.

¹³⁷ See 1978 Hearings, *supra* note 10, at 180.

¹³⁸ See *Id.* at 180 (figure 2).

¹³⁹ *Id.* at 1.

¹⁴⁰ See *id.* at 244.

¹⁴¹ *Id.* at 31-33.

¹⁴¹ *Id.* at 31-33. Another impetus for the AFC contract was President Carter's non-proliferation policy, which had as one cornerstone an assured source of supply of nuclear fuel from the United States. The AFC contract, by reducing some contractual commitments, freed some federal enrichment capacity to meet this assurance. See Bujon, *supra* note 10, at 3.

tween enrichment commitments and actual needs, although utilities noted that "even greater flexibility is needed."¹⁴²

G. Further Efforts to Put Humpty Together Again: The New U.S. Enrichment Contract

While schedule delays continued the surpluses of enriched uranium and natural uranium continued to accumulate. By 1983, privately held stocks of enrichment and natural uranium in the United States approximated four to five years of requirements. (DOE stocks, which were procured prior to 1970, are reportedly roughly equivalent.) Moreover, DOE's costs continued to increase and DOE's construction of the now unneeded gas centrifuge facility continued. Eurodif and Urenco, two foreign government consortia, were offering enrichment services on terms more attractive than those which could be obtained from DOE. The agency was facing even stiffer competition on the secondary market from utilities selling unneeded enriched uranium at prices well below those offered by the federal government. DOE's requirements contract customers were deserting the agency in favor of these more attractive alternatives as well as for nationalistic reasons.¹⁴³ The agency's other customers were busily calculating whether it was cheaper to stay with DOE or to pay the hefty termination charges specified in their contracts and procure enrichment services from Europe or on the secondary market. Sherry Peske, DOE's enrichment marketing director, calculated that the agency had lost "20 contracts in total since 1979, with a revenue value of more than \$5 billion, and we have lost over \$2 billion in partial terminations of the requirements contracts."¹⁴⁴ DOE was forced to frankly acknowledge that its policies were seriously flawed. In the words of Assistant Secretary Brewer:

The United States has not operated [the] enrichment enterprise as a business, with sound business practices. Over the years,

¹⁴² *Id.* at 121 (testimony of John Kearny, Vice President of Edison Electric Institute).

¹⁴³ See Einbund, *Foreign Enrichment of Uranium for U.S. Nuclear Utilities*, PUB. UTIL. FORT. April 13, 1983 at 43; *DOE Revises the Uranium Enrichment Program*, PUB. UTIL. FORT., March 15, 1984 at 47.

¹⁴⁴ Business Panel, *supra* note 2, at 61. Eighteen of 20 cancellations involved West German, Spanish, Swedish or Swiss interests. The two cancelled domestic contracts involved Public Service of New Hampshire's troubled Seabrook facilities. West German business went to Urenco, which is owned in part by West Germany. Spanish business went in large part to Eurodif, which is owned in part by Spain.

we have misread and, in some cases, disregarded the market. We have handcuffed ourselves with contracting and marketing constraints, either real or imagined, and we have acted as though we are monopolists when we are not. . . . [L]arge mortgages were incurred which have to be picked up in the rate base.¹⁴⁵

DOE finally had started to address the mismatch of actual demand with its enrichment program.

On January 18, 1984, after negotiations with its utility customers, the agency adopted another new contract — the “Utility Services” or “US” Enrichment Contract.¹⁴⁶ The agency described its new contract as a requirements contract.¹⁴⁷ DOE allowed fixed commitment customers electing to convert a one-time opportunity to reduce without penalty their commitments to the agency for FY 1985-86 by roughly 30% and to eliminate fixed commitments after FY 1986.¹⁴⁸ In addition, under the new contract, customers were obligated to take only 70% of their “requirements” from DOE. The remainder could be satisfied from other sources; preferably, DOE hopes the difference will come from the secondary market of SWU’s so as to work off the enrichment surplus and remove its destabilizing effect.¹⁴⁹ DOE also offered to be bound by a ceiling price of \$135, subject to escalation for electricity and the purchasing power of the dollar.¹⁵⁰ On September 4, 1985, the actual price was reduced effective October 1 to \$125/SWU.¹⁵¹ The contract was enthusiastically received by DOE’s customers. Duke Power led the

¹⁴⁵ *Uranium Enrichment Policy: Hearings Before the Energy Conservation & Power Subcomm. of the House Energy & Commerce Comm.*, 98th Cong., 1st & 2d Sess. 10, 188 (1983-84) [hereinafter 1983-84 Hearings].

¹⁴⁶ GAO Letter, *supra* note 24, at 4.

¹⁴⁷ See *Energy and Water Development Appropriation for 1985, Part 6: Hearings Before the Subcomm. on Energy and Water Development of the House Appropriations Comm.*, 98th Cong., 1st Sess. 901, 907, 994 (1984) (testimony of DOE Assistant Secretary Brewer).

¹⁴⁸ See DOE, Questions and Answers on the Terms and Conditions for Conversion to the Utility Services (US) Contract for Uranium Enrichment Services 3 (Q/A 14) (Feb. 16, 1984) [hereinafter DOE Questions and Answers].

¹⁴⁹ A major purpose of the contract is “to dry up the secondary market as quickly as possible.” *Radical Surgery*, *supra* note 10; see also Business Panel, *supra* note 2, at 14.

¹⁵⁰ DOE Questions and Answers, *supra* note 148, at Q/A G. 54.

¹⁵¹ Answer to Question 7(C) attached to Letter from R. G. Rabben (DOE) to Chairman Udall (December 13, 1985).

charge, signing a new Utility Services Contract on February 6, 1984.¹⁵² The impact of the new contract in erasing artificial demand for enrichment is significant indeed. Some experts estimate that it cuts actual demand for uranium by tens of millions of pounds over the next 5 to 10 years.¹⁵³

The DOE, conscious that it was required by statute to recover costs over a reasonable period of time and that it cannot lawfully cut its price without controlling its costs, started to carefully review its programs. The agency finally stopped work on the Portsmouth gas centrifuge after an investment of \$2.7 billion. The DOE expected at least \$4.0 billion would be required for completion and the competitiveness of the facility was uncertain.¹⁵⁴ On June 5, 1985, the agency also decided to place the Oak Ridge gaseous diffusion [hereinafter GD] enrichment facility on standby in order to save costs.¹⁵⁵

DOE's new contract has drawn praise from the electric utility industry and the agency's cost-shaving measures were acknowledged by a special House Tri-Committee Business Advisory Panel.¹⁵⁶ Indeed, the Panel reported that it "applaud[s] the transition to a more business like approach that has taken place at DOE and strongly endorses its continuation."¹⁵⁷

III. SOME LEGAL CONSIDERATIONS RELATING TO DOE'S NEW URANIUM ENRICHMENT CONTRACT

A. *Compliance with the Section 161v. Criteria*

Section 161v. of the AEA requires DOE enrichment services to be provided in accordance with written "criteria," previously submitted for 45-day review before Congress, "setting forth the terms and conditions" under which toll enrichment is to be

¹⁵² Business Panel, *supra* note 2, at 137.

¹⁵³ See ANDERSON (OF NUEXO), ENRICHED URANIUM SALES EFFECT ON SUPPLY INDUSTRY (Sept. 1984); NUCLEAR RESOURCES INTERNATIONAL, DOE ENRICHMENT POLICIES AND THE U.S. URANIUM INDUSTRY (Sept. 1984).

¹⁵⁴ See *Hearing Before the Energy and Env. Subcomm. of House Interior & Insular Affairs Comm.*, 99th Cong., 1st Sess. 6-7 (Oct. 22, 1985) (statement of John R. Longenecker (DOE)).

¹⁵⁵ *Id.* at 5.

¹⁵⁶ The Panel was chaired by Mr. William Lee, Chairman of Duke Power, a strong proponent of the Utility Services Contract and a major user (up to 6% of DOE sales) of DOE civilian enrichment sales. See Business Panel, *supra* note 2, at 237-39.

¹⁵⁷ *Id.* at XIV.

provided. The legislative history indicated that the terms and conditions of the criteria "would be such matters as the charges for enrichment services, the conditions under which such services would be offered, and the general features of standard contracts for uranium enrichment service."¹⁵⁸ AEC's criteria issued pursuant to Section 161v. are the functional equivalent of regulations.¹⁵⁹

The rule that an agency action in violation of a governing statute¹⁶⁰ or regulation¹⁶¹ is null and void is no less true in the area of agency contracts:¹⁶² "[W]hen an agent of the government enters a contract that does not satisfy statutory or regulatory conditions, the courts cannot bind the government to the contract."¹⁶³ The DOE's uranium enrichment contract will be unlawful if it violates the existing criteria issued under Section 161v. irrespective of whether the existing criteria are inconsistent with DOE efforts to preserve or to maximize the United States market share or are for some other reason outdated. The question of DOE's compliance with the applicable criteria for enrichment is of critical importance in determining whether the agency's new "Utility Services" contract complies with the law.

¹⁵⁸ H.R. REP. NO. 1702, 88th Cong. 2d Sess. 16 (1964); S. REP. NO. 1325, 88th Cong., 2d Sess., 16 (1964), *reprinted in* 1964 U.S. CODE CONG. & ADMIN. NEWS 3105, 3121.

¹⁵⁹ At the time the "criteria" were issued, the AEC was subject to the requirements of the Administrative Procedure Act (APA). *See* 42 U.S.C. § 2231 (1973); Siegel v. AEC, 400 F.2d 778 (D.C. Cir. 1968). Ordinarily matters of general applicability such as the enrichment criteria would be subject to informal notice-and-comment rulemaking under 5 U.S.C. § 553. However, § 553(a)(2) contains an exception to this norm for matters relating to contracts and sale of government property or services. Thus AEC never formally invoked APA rulemaking procedures in issuing either its criteria or its standard enrichment contracts. However, the agency did in effect propose the criteria for public comment through the 45-day congressional review process, and, until issuance of the new U.S. enrichment contract, accompanied each change in basic contract instruments with a criteria change for which 45-day congressional review was had.

¹⁶⁰ 5 U.S.C. § 706(2)(B) & (C) (1977); *United States v. Larionoff*, 431 U.S. 864, 873 (1977); *City of Santa Clara, Cal. v. Andrus*, 572 F.2d 660, 677 (9th Cir. 1978), *cert. denied*, 439 U.S. 859 (1979).

¹⁶¹ *Morton v. Ruiz*, 415 U.S. 199, 235 (1974); *Vitarelli v. Seaton*, 359 U.S. 535, 539-40 (1959); *Service v. Dulles*, 354 U.S. 363, 388 (1957); *Brown Express, Inc. v. United States*, 607 F.2d 695, 703 (5th Cir. 1979); *Pickus v. United States Board of Parole*, 507 F.2d 1107, 1114 (D.C. Cir. 1974).

¹⁶² *See also* *Schweiker v. Hanson*, 450 U.S. 785 (1981), *reh'g denied*, 451 U.S. 1032 (1981). *Compare* *Augusta Aviation, Inc. v. United States*, 671 F.2d 445, 448 (11th Cir. 1982) (statute) *with* *Federal Crop Insurance Corp. v. Merrill*, 332 U.S. 380, 386 (1947) (regulations).

¹⁶³ *Augusta Aviation Inc. v. United States*, 671 F.2d at 449.

DOE's compliance with the applicable criteria is, on the one hand clear, and on the other, cloudy. Without a doubt, DOE is not in compliance with the 1973 criteria that were in force prior to the agency's promulgation of new criteria on July 29, 1986. It is equally clear that DOE is in compliance with its July 29 criteria, portions of which have been suspended by the Appropriations Committees in the context of the Continuing Resolution adopted in the closing days of the 99th Congress. DOE's July 29 criteria, however, do not comply with the substantive requirements of Section 161v. of the AEA. Accordingly, even though Congress did not suspend DOE's new criteria, the ultimate lawfulness of the agency's new criteria and its enrichment contract is in doubt.

1. DOE's New Contract Under the Pre-July 1986 Criteria

The General Accounting Office has repeatedly asserted that DOE's new contract does not comport with the pre-1986 criteria. GAO's analysis was originally made in response to an inquiry from Chairman John Dingell of the House Energy and Commerce Committee and then-Chairman Richard Ottinger of the Subcommittee on Energy Conservation and Power. GAO's conclusions are set forth in a letter to Messrs. Dingell and Ottinger dated December 27, 1984. The letter identifies several inconsistencies between DOE's contract and the then-existing criteria. For simplicity, only two primary concerns are considered.

First, the pre-1986 criteria provided that "[t]he primary contracting vehicle for DOE to supply enrichment services for nuclear power reactors on a long-term basis shall be a Fixed Commitment contract."¹⁶⁴ In contrast, GAO notes that DOE "has repeatedly referred to the Utility Services Contract as a requirements type contract."¹⁶⁵ This GAO criticism is unmistakably apposite. The trend of the federal government's enrichment program since introduction of the 1973 "fixed commitment" criteria and LTFC contract has been a slow return to a require-

¹⁶⁴ GAO letter, *supra* note 24, at 6 (citing 44 Fed. Reg. 28876 (1979)).

¹⁶⁵ *Id.* at 6 (citing *Hearings Before the Subcommittee on Energy and Water Development, House Appropriation Comm.*, 98th Cong., 1st Sess. 901, 907, 916, 994 (1984) (testimony of Mr. Shelby T. Brewer, Assistant Secretary for Nuclear Energy, Energy and Water Development Appropriation for 1985, Part 6)).

ments-based contract. DOE has admitted as much.¹⁶⁶ Moreover, DOE repeatedly has testified to Congress that its "new contracts are based on individual customer needs rather than on fixed commitments. . . ."¹⁶⁷ Indeed, Assistant Secretary Brewer frankly declared that the new US contract "is a requirement contract based on a customer's actual needs, not a fixed commitment to accept unneeded SWU's over a long period of time."¹⁶⁸ Consistent with DOE's characterization, the Utility Services Contract speaks in terms of a customer's requirements, and specifies only that a portion of these requirements be procured from DOE. As the United States District Court in *Western Nuclear v. Huffman* has accurately observed,

[t]he new utility services contract is clearly not a Fixed Commitment Contract. Rather, it states that the customer shall purchase a percentage [to be agreed upon by the parties but no less than seventy percent] of the Customer's requirements. This language creates a 'requirements' contract.¹⁶⁹

In short, DOE's new contract is precisely the opposite genre from that specified in the pre-1986 criteria.

Second, GAO notes that the pre-1986 criteria do not contain any provisions authorizing a guaranteed ceiling price. The Utility Services Contract contains a guaranteed ceiling price.¹⁷⁰ GAO

¹⁶⁶ See, e.g., *id.* at 6; Business Panel, *supra* note 2, 59-61 (Sherry Peske describes AFC contract as "kind of halfway between requirements and long-term fixed commitment.').

¹⁶⁷ *Hearing Before the Subcomm. on Energy and the Environment, House Comm. on Interior and Insular Affairs, 99th Cong., 1st Sess. 8 (1985)* (statement of Shelby T. Brewer, Deputy Assistant Secretary for Uranium Enrichment). The requirements nature of the contract is also repeatedly made manifest in DOE, Questions and Answers on the Terms and Conditions for Conversion to the Utility Services (US) Contract for Uranium Enrichment Services, Feb. 16, 1984 (Q/A 13, 14, B.7, E.18, and Y.29).

¹⁶⁸ 1983-84 Hearings, *supra* note 145, at 188.

¹⁶⁹ *Western Nuclear v. Huffman*, No. 84-C-2315, Slip Op. at 2-3 (D. Colo. Sept. 30, 1985); see also *Mason v. United States*, 615 F.2d 1343, 1346 (Ct. Cl. 1980), (*citing Media Press, Inc. v. United States*, 566 F.2d 1191 (Ct. Cl. 1977)); *Bank of America National Trust and Savings Ass'n v. Smith*, 336 F.2d 528, 529 n.1 (9th Cir. 1964); *Shader Contractors, Inc. v. United States*, 276 F.2d 1, 4 (Ct. Cl. 1960). A requirements contract can also be for only a part of the buyer's requirements. See, e.g., *City of Louisville v. Rockwell Mfg. Co.*, 482 F.2d 159, 164 (6th Cir. 1973).

¹⁷⁰ The Utility Services Contract guarantees that DOE will not charge a price higher than \$135/SWU. This ceiling price may be adjusted to reflect changes in DOE's costs for electricity and the GNP Deflator. See Business Panel, *supra* note 2, at 65.

argues that this represents an inconsistency with the pre-1986 criteria. In a nutshell, GAO argues that:

[a] guaranteed ceiling price is a very material provision of a contract, particularly when the ceiling price appears to be below [DOE's] current costs of providing enrichment services and [DOE's] program statute requires recovery of its costs over a reasonable period of time.¹⁷¹

GAO points out that the pre-1986 criteria do not authorize a ceiling price; Congress forced the AEC to narrow its 1973 criteria and in response AEC specifically *deleted* authorization for a ceiling price. More to the point, GAO observes that

[t]he AEC's rationale [for the deletion] was that a guaranteed ceiling charge could preclude compliance with the statutory directive to recover the Government's costs over a reasonable period of time should the Government have to undertake the construction of additional enrichment capacity.¹⁷²

GAO then argues that

the concern which prompted the AEC to delete the guaranteed ceiling price provisions from the criteria in 1973 is still applicable today, namely, the fear that a guaranteed ceiling price could preclude compliance with both the statutory and criteria directive to recover the Government's costs over a reasonable period of time.¹⁷³

For these and other reasons, the GAO has concluded

that [DOE] should have amended its uranium enrichment services criteria to conform them to the anticipated provisions of the Utility Services Contract, because the new contract includes provisions that either conflict with or are not specifically authorized by the current criteria.¹⁷⁴

¹⁷¹ GAO Letter, *supra* note 24, at 7.

¹⁷² *Id.* at 8.

¹⁷³ *Id.* at 8-9. GAO also raised other objections, including the non-compliance of the termination charges with the pre-1986 criteria requirement that they be related to costs (*id.* at 7) and inclusion of a "variable tails assay options" or VTAO in the absence of any express authorization.

¹⁷⁴ *Id.* at 9 (GAO reiterated this view in its testimony, *Hearing Before the Energy and Environment Subcomm. of the House Comm. on Interior and Insular Affairs*, 99th Cong., 1st Sess. 5 (March 21, 1985) (statement of Daniel C. White)).

The *Western Nuclear* court agreed, noting that a ceiling price provision “was deliberately deleted [from the criteria] in 1973 because of concern that a ceiling price would preclude compliance with the statutory directives that the government must recover its costs over a reasonable period of time.”¹⁷⁵ The district court declared the Utility Services Contract null and void, in a ruling affecting more than \$20 billion worth of contract commitments.¹⁷⁶ DOE has appealed.¹⁷⁷

2. Compliance with the Administrative Procedure Act as Modified by the DOE Organization Act

In addition to the substantive requirements specified in the criteria issued pursuant to Section 161v. of the AEA, DOE's activities with respect to its enrichment program must generally comply with the provisions of the APA. This obligation arises from the Atomic Energy Act,¹⁷⁸ and the specific requirement of DOE's organic act.¹⁷⁹ Indeed, Section 501(a)(1) of the DOE Act¹⁸⁰ requires all DOE rules and regulations, or orders having the applicability and effect of a rule, to comply not only with the APA, but also with certain additional requirements.¹⁸¹

The initial question is whether DOE's standard contract, or at least its generic terms and conditions, constitute a rule for APA purposes. The APA defines “rules” to mean

the whole or a part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy . . . includ[ing] the approval or prescription for the future of rates, wages, corporate or financial structures or reorganization thereof, prices, facilities, appliances, services or allowances therefore or of

¹⁷⁵ *Id.* (citing 1973 Hearings, *supra* note 9, at 446).

¹⁷⁶ *Doubts Pervade Nuclear Fuel Industry*, Wall St. J., Oct. 7, 1985, at 6, col. 1.

¹⁷⁷ *Western Nuclear*, No. 84-C-2315 (D. Colo. Sept. 30, 1985), *appeal docketed*, No. 86-1942 (Sept. 24, 1985).

¹⁷⁸ 42 U.S.C. § 2231 (1973).

¹⁷⁹ Section 501 of the Department of Energy Organization (DOE) Act, 42 U.S.C. § 7191(a)(1)(1973).

¹⁸⁰ 42 U.S.C. § 7191(a)(1) (1973).

¹⁸¹ The additional requirements are found in section 501(b) & (c). These include special notice, analysis, disclosure, and public hearing requirements. 42 U.S.C. § 7191(b) & (c) (1973).

valuation, costs or accounting, or practices bearing on any of the foregoing.¹⁸²

A standard contract intended to be of general applicability, or at least its generic terms and conditions, clearly fits this definition. A new standard contract, or at least the new significant features thereof, is generic in nature, and is "designed to implement, interpret or prescribe law or policy" with respect to toll enrichment. It amounts to the "prescription for the future of prices, facilities, . . . services, . . . or practices bearing on" enrichment services.¹⁸³ As a corollary, "criteria" of general applicability governing DOE's enrichment contracts also fit this definition.

Having decided that a new standard enrichment contract is a rule, the next question is to determine the APA's impact on DOE's actions. The most significant APA provision applicable to agency rulemaking is the notice and comment rulemaking procedures embodied in section 553 of the APA.¹⁸⁴ Rules relating to contracts and sales of government services, however, are excepted from the notice and comment rulemaking requirement.¹⁸⁵ Notwithstanding this exception, Congressman Dingell, following a recommendation of a committee of the American Bar Association,¹⁸⁶ inserted language into the DOE organic act overriding this exception with respect to all DOE rules relating to contracts and sales of services.¹⁸⁷ The Dingell Amendment, codified in Section 501(b)(3) of the DOE Act,¹⁸⁸ renders DOE's rules, regulations or orders with respect to public property, loans, grants, or contracts, subject to notice and comment rulemaking requirements specified in 5 U.S.C. § 553. As GAO has

¹⁸² 5 U.S.C. § 551(4) (1977).

¹⁸³ The new generic contract and many of the "criteria" relating thereto clearly affect rates for enrichment services. Rulemaking is generally recognized to constitute rulemaking for purposes of the APA. See, e.g., *United States v. Tex-La Electric Cooperative, Inc.*, 693 F.2d 392, 401 n.12 (5th Cir. 1982); *Colorado River Energy Distributors Ass'n v. Lewis*, 526 F. Supp. 926, 932 (D.D.C. 1981).

¹⁸⁴ 5 U.S.C. § 553 (1977).

¹⁸⁵ 5 U.S.C. § 553(a)(2) (1977).

¹⁸⁶ See Bonfield, *Public Participation in Federal Rulemaking Relating to Public Property, Loans, Grants, Benefits or Contracts*, 118 U. PA. L. REV. 540 (1970).

¹⁸⁷ 123 CONG. REC. H5325 (daily ed. June 2, 1977) (Mr. Dingell offers amended §§ 501-02); see H. R. CONF. REP. No. 95-539, 95th Cong., 1st Sess., 83 (1977) (adopting modification of House version).

¹⁸⁸ 42 U.S.C. § 7191(b)(3) (1973).

found, DOE made no attempt to comply with either the rule-making requirements specified in the APA as made applicable by the Dingell Amendment, or other requirements specified in Section 501 of the DOE Act.¹⁸⁹

The uranium enrichment criteria extant prior to adoption of the DOE Act of 1977 are not affected by Section 501 by reason of the savings clause in Section 705 (a) of the DOE Act.¹⁹⁰ Thus, if the Utility Services Contract complied with the 1973 criteria, DOE would have an argument that issuance of the new contract does not trigger notice and comment rulemaking. GAO, however, has identified several particulars in which the new contract contains generic provisions which either violate or are not authorized by the existing criteria.¹⁹¹ These generic provisions are intended to be of general applicability. Any one of these would appear sufficient to warrant the rulemaking procedures.

An agency action taken in violation of applicable notice and comment rulemaking requirements is null and void.¹⁹² For example, in *State of Florida v. Matthews*,¹⁹³ a district court invalidated certain actions by the Department of Health, Education and Welfare (HEW) relating to property and contracts on the ground that the actions constituted rules and the exception under Section 553(a)(2) of the APA was, as here, unavailable to the agency.¹⁹⁴ Consonant with this analysis, GAO has indicated its view that DOE acted in contravention of the APA and Section 501 of the DOE Act in taking at least some of the actions embodied in the new utility contract.¹⁹⁵

¹⁸⁹ GAO Letter, *supra* note 24, at 5.

¹⁹⁰ 42 U.S.C. § 7295(a) (1973).

¹⁹¹ *E.g.*, GAO Letter, *supra* note 24.

¹⁹² *NRDC v. EPA*, 683 F.2d 752, 767 (D.C. Cir. 1982); *Brown Express, Inc. v. United States*, 607 F.2d at 703; *Pickus v. United States Board of Parole*, 507 F.2d at 1114; *American Academy of Pediatrics v. Heckler*, 561 F. Supp. 395, 400-01 (D.D.C. 1983); *City of New York v. Diamond*, 379 F. Supp. 503, 515-16 (S.D.N.Y. 1979); see also *supra* notes 160-164 and accompanying text.

¹⁹³ 422 F. Supp. 1231 (D.D.C. 1976).

¹⁹⁴ *State of Florida v. Matthews*, 442 F. Supp. at 1250. See also *Rodway v. United States Dep't of Agriculture*, 514 F.2d 809, 813-14 (D.C. Cir. 1975) (agency which adopts regulation making (a)(2) exception unavailable must thereafter comply with notice and comment rulemaking requirements).

¹⁹⁵ See GAO Letter, *supra* note 24, at 11. It is interesting to note that DOE proposed its generic contract for disposal of spent nuclear fuel for comment, treating it as a rule for purposes of the APA. Compare 48 Fed. Reg. 5458 (1983) with 48 Fed. Reg. 16590 (1983) (promulgating 10 CFR Part 961).

DOE's chief legal argument against this line of reasoning was that its Utility Services Contracts are custom-tailored individual applications resulting from customer-specific negotiations rather than contracts of general application.¹⁹⁶ But there seems little question that these "individualized negotiated agreements" were based on the generic Utility Services Contract and that the terms and conditions in each of the individual contracts are similar to the generic pattern.¹⁹⁷ Indeed, John Longenecker, DOE Deputy Assistant Secretary for Enrichment, when explaining the new Utility Services Contract, testified that "[w]e do not have the flexibility in the U.S. enrichment enterprise to do predatory pricing, *to treat customers differently, [or] to tailor-make contracts.*"¹⁹⁸

3. The Impact of the July 29, 1986 Criteria

Although DOE contends that its existing contract complies with the pre-1986 criteria and that its issuance did not violate the notice and comment rulemaking requirements of the APA, the agency in January 1986 proposed and within six months promulgated new enrichment criteria. The new criteria clearly are intended to apply retroactively to moot the various grounds on which the lawfulness of DOE's new uranium enrichment contract has been challenged. For example, the July 29, 1986 criteria purport to immunize all the agency's prior contracts. Section 762.15 of the new criteria expressly states that "[a]ll contracts under which DOE was providing enrichment services prior to the adoption of these criteria are valid . . . [and] [t]hese prior contracts may be amended to conform to these criteria without penalty, if both parties agree."¹⁹⁹

DOE's action poses a number of analytical difficulties. If the criteria are lawful, they may well moot the claim that the

¹⁹⁶ See GAO Letter, *supra* note 24, at 5; see also *Western Nuclear v. Huffman*, D. Colo. No. 84-C-2315 (declaration of Sherry E. Peske "the contracts are individualized negotiated agreements" and "deviations from [the proposed generic contract] are substantial and material").

¹⁹⁷ In any event, if DOE in fact were adopting an individualized approach to enrichment contracting, the agency would appear to be in violation of the requirement in section 161v. that prices for services rendered domestic customers "shall be established on a nondiscriminatory basis." 42 U.S.C. § 2201v(B)(i) (1973).

¹⁹⁸ Business Panel, *supra* note 2 at 6 (emphasis added).

¹⁹⁹ 51 Fed. Reg. at 27146 (1986) (to be codified at 10 C.F.R. § 762.15).

new enrichment contract was issued in violation of notice and comment requirements and the pre-existing criteria.²⁰⁰ However, the question remains as to whether the new enrichment criteria are lawful. In particular, DOE expressly indicates in the preamble to its proposed criteria, and the President's Fiscal Year 1987 budget confirms, that under the new criteria the agency will "write-off" some \$4.1 billion in prior unrecovered costs of providing enrichment services to civilian customers.²⁰¹ In addition, the criteria purport to afford DOE discretion to alter the "write-off" amount either upward or downward, upon consideration of such factors as "market share, need to reduce the deficit, [and] reliability of service at competitive prices."²⁰² Furthermore, DOE claims discretion to determine what future costs are "appropriate" to recover from its customers.²⁰³ GAO has testified that the purported "write-off" violates the full-cost recovery requirement of Section 161v. of the Atomic Energy Act, and that the agency's claim of discretion with respect to additional past and future costs is also impermissible under the Act.²⁰⁴ GAO has also indicated that the numerous points of discretion claimed by DOE under its new proposed criteria in essence render oversight of DOE's performance by GAO — and by Congress — all but impossible. This latter criticism is particularly alarming, for it defeats the basic purpose of the criteria requirement embodied in Section 161v..²⁰⁵

If the new criteria are in fact contrary to Section 161v., they cannot serve to immunize DOE's enrichment policies from litigation advancing claims of substantive deficiencies. DOE appears to be relying on two arguments to protect its position from substantive attack. First, the agency appears to claim that if

²⁰⁰ See *San Luis Obispo Mothers for Peace v. NRC*, 751 F.2d 1287, 1314 & 1317 (D.C. Cir. 1984), *vacated and reh'g granted en banc on other grounds*, 760 F.2d 1320 (D.C. Cir. 1985) (reference to other proceedings satisfactory, and relief would serve no practical purpose).

²⁰¹ See also DOE Memorandum, Unrecovered Government Investment, August 11, 1986. Compare 51 Fed. Reg. 3629 (1986) with OMB, MAJOR POLICY INITIATIVES (1986).

²⁰² 51 Fed. Reg. 27145 (1986) (to be codified at 10 C.F.R. § 762.6).

²⁰³ *Id.*

²⁰⁴ *Hearing Before the Subcomm. on Energy and the Env. of the House Interior and Insular Affairs Comm.*, 99th Cong., 2d Sess. 3 (1986) (statement of Keith Fultz (GAO)).

²⁰⁵ *Id.* at 3-4.

Congress does not suspend the criteria by legislation,²⁰⁶ then it should be deemed to have "acquiesced" and thereby ratified its treatment of the issue.²⁰⁷

Even in the absence of any congressional action, DOE's position seem difficult. To be sure, there is a line of cases (starting with the Supreme Court's decision in *Power Reactor Development Company*)²⁰⁸ holding that an interpretation of the Atomic Energy Act by the old Atomic Energy Commission, which was presented to, and reviewed by the former Joint Committee on Atomic Energy, is entitled to great deference.²⁰⁹ However, Congressional inaction in today's environment should not carry such great weight. Because the AEC realized that the Joint Committee could relatively easily pass legislation barring Commission action, requirements such as Section 161v. providing for AEC initiatives to "lie before" or be presented to the Joint Committee were extremely effective in maintaining Congressional control over the agency.²¹⁰ Under these circumstances Joint Committee inaction could in general be inferred to constitute approval. However, after the break-up of the Joint Committee in 1977, oversight was spread among a number of committees in both the Senate and the House of Representatives.²¹¹ This fracturing of authority is further compounded by a dilution of power on the part of the authorizing committees in favor of the appropriation committees in the legislative process.

Congressional action to remedy agency conduct not in compliance with existing law in the atomic energy area has thus become much more difficult. In fact, Congress' ability to assure compliance with statutory requirements in the relevant area is now no greater than in any other area in which Congress has delegated to an agency and courts are called upon for judicial

²⁰⁶ Under *INS v. Chadha*, 462 U.S. 919 (1983), the new criteria can be disapproved only by enacting legislation.

²⁰⁷ *Cf.* Brief for Appellants (DOE, et al) at 30-36, *Western Nuclear v. Huffman*, No. 86-1942 (10th Cir. Sept. 24, 1985) (appeal docketed).

²⁰⁸ *Power Reactor Dev. Co. v. International Union of Electrical, Radio & Machine Makers*, 367 U.S. 396 (1961).

²⁰⁹ *Id.* at 408-09; see also *New Hampshire v. AEC*, 406 F.2d 170, 174 n.5 (1st Cir.), cert. denied, 395 U.S. 962 (1969).

²¹⁰ Green, *The Joint Committee on Atomic Energy: A Model for Legislative Reform*, 32 GEO. WASH. L. REV. 932, 939 (1964).

²¹¹ 42 U.S.C. § 2258 (1986).

review. Consequently, no special weight should be given to possible Congressional inability to overturn the criteria.

More to the point, Congress' response to the July 29, 1986 criteria has been highly critical and can hardly be deemed acquiescence or ratification. The full Senate adopted language of the Senate version of the debt ceiling legislation (House Jt. Res. 497) disapproved DOE's July 29 criteria.²¹² A free-standing House Joint Resolution (No. 699) to similar effect was introduced²¹³ and cleared both the Interior and Insular Affairs Committee and the Energy and Commerce Committee.²¹⁴ In the rush to adjournment, the two efforts were not linked. However, the House Appropriations Committee agreed to language depriving DOE of funds to carry out certain features of the criteria bearing on the enrichment of foreign-source uranium pending a judicial resolution of that issue.²¹⁵ Numerous floor statements and colloquies indicated that this action was to be taken as neutral on disputes concerning the lawfulness of DOE's new enrichment criteria and the purported write-off of \$4.1 billion in enrichment debt.²¹⁶

²¹² See 132 CONG. REC. S10131 & S10168 (daily ed. August 1, 1986) (statements by Senators Domenici, Garn and Bingaman); 132 CONG. REC. S11089 (daily ed. August 9, 1986) (adoption). Senator Domenici favored disapproval of the criteria principally because he felt that the enrichment debt should be reduced to \$350,000,000. Senators Garn and Bingaman expressed concern that the write-off embodied in the criteria was beyond DOE's power and that DOE had failed to assure the maintenance of a viable domestic uranium industry as required under Section 161v. of the AEA.

²¹³ 132 CONG. REC. H5697 (daily ed. August 7, 1986) (introduction); *id.* at E2795 (daily ed. August 8, 1986) (statement by principal sponsor, Mr. Richardson).

²¹⁴ See, e.g., 123 CONG. REC. H8619 (daily ed. Sept. 29, 1986), *announcing* H. Rept. 99-926, 99th Cong., 2d Sess., pt. 1.

²¹⁵ 123 CONG. REC. H10844-45 (daily ed. Oct. 15, 1986) (Conference Report on H. R. Res. 738, the Continuing Resolution).

²¹⁶ 123 CONG. REC. H10960 (daily ed. Oct. 15, 1986) (Cong. Conte: no interference with pending litigation); *id.* H11042 (Cong. Young: "I wish to stress that the Congress is in no way, and I repeat in no way, approving the new criteria, nor DOE's new enrichment contract. . . ."). Congressman Markey asserted that the Continuing Resolution "ratifies the disapproval action of the Committees of jurisdiction." 123 CONG. REC. H10972 (daily ed. Oct. 15, 1986). He was especially critical of "the \$4 billion taxpayer ripoff." *Id.* H10973; see also 123 CONG. REC. E3766 (daily ed. Oct. 17, 1986) (Cong. Cheny: Congress "in no way endorses DOE's enrichment criteria, or condones the Department conduct in flouting the specific requirement of section 161v. . . ."); *id.* E3724-25 (Cong. Hansen: Generally critical of DOE); 123 CONG. REC. S16633 (daily ed. Oct. 16, 1986) (colloquy between Mr. Garn and Mr. Domenici: "no intent to alter Section 161v."); *id.* 16638 (colloquy between Mr. Helms and Mr. Domenici: neutral on validity of contracts).

*Tennessee Valley Authority v. Hill*²¹⁷ is closely on point. In that case, the Supreme Court rejected the argument that continued appropriations for the Tellico Dam constituted Congressional ratification of that project notwithstanding its conflict with the Endangered Species Act.²¹⁸ The Court explained that repeals by implication are disfavored²¹⁹ and that this doctrine is especially applicable where "the claimed repeal rests solely on an Appropriation's Act."²²⁰ "When voting on appropriation measures," the Court said, "legislators are entitled to operate under the assumption that the funds will be devoted to purposes which are lawful and not for any purpose forbidden."²²¹ Moreover, "[e]xpressions of committees dealing with requests for appropriations cannot be equated with statutes enacted by Congress. . . ."²²² It follows that the partial suspension of the new criteria by the Appropriations Committees can not be deemed ratification of criteria violating the law, particularly in view of rejection of the criteria by the full Senate and the two House authorization committees with principal jurisdiction.

This still leaves DOE a second argument, which is that the agency enjoys the flexibility to write-off unrecovered government investment in order to remain competitive, increase its market share, or achieve other market-oriented or foreign policy goals. GAO takes the position that DOE lacks this flexibility.²²³ As amended in 1970, Section 161v. provides categorically that "any prices established under this subsection shall be on a basis of recovery of the Government's costs over a reasonable period of time. . . ."²²⁴ Under this provision, DOE's "uranium enrichment program is required by statute to recover its costs."²²⁵ On the face of the statute, DOE's write-off would appear unlawful.

DOE's response focuses on the original 1966 criteria (adopted pursuant to Section 161v.). The 1966 criteria provide that the federal enrichment program must recover all costs, both direct

²¹⁷ 437 U.S. 153 (1978).

²¹⁸ 16 U.S.C. § 1531 (1982).

²¹⁹ 437 U.S. at 189.

²²⁰ *Id.* at 190.

²²¹ *Id.*

²²² *Id.* at 191.

²²³ See, e.g., Statement of Keith Fultz, *supra* note 204.

²²⁴ 42 U.S.C. § 2201(v)(B)(iii) (1973).

²²⁵ *United States v. Consolidated Edison of New York*, 452 F. Supp. 638, 657 (S.D.N.Y. 1977), *modified*, 580 F.2d 1122 (2d Cir. 1978).

and indirect, and specifically indicated that the program must recover costs for "appropriate depreciation." The agency, relying on legislative history associated with the 1964 amendments, argues that it enjoys flexibility.²²⁶ DOE at one time might have enjoyed some flexibility to take write-offs, but for a number of reasons that flexibility either no longer exists or is inapplicable. First and foremost, the 1966 criteria were adopted at a time when the statute provided for prices affording "reasonable compensation to the government." The Joint Committee directed that this term be construed flexibly to take into account not only the government's costs but also the national interest in the development and utilization of nuclear power. The Joint Committee viewed as consistent with this approach AEC's action in initially not recovering depreciation attributed to unused portions of diffusion plants in order to meet the immediate problem of a substantial decline in enrichment services needed for military purposes. The statute, however, was amended in 1970 to curtail the agency's flexibility. The 1966 criteria cannot be read in a fashion inconsistent with the statute as amended.²²⁷

²²⁶ 51 Fed. Reg. 3626 n.5 (1986). DOE formerly argued more narrowly that it was inappropriate to recover depreciation for unused capacity for which a write-off may be taken under General Accepted Accounting Principles (GAAP); see, e.g., *Hearing Before the Energy and Env. Subcomm. of the House Int. and Insular Affairs Comm.*, 99th Cong., 1st. Sess. (1985) (DOE Answer to Question 8 propounded by Chairman Udall, Prehearing Questions and Answers Relating to the October 11, 1985). It is not clear that a write-off is appropriate under GAAP for the GD plants in question and it is even less clear that GAAP is relevant at all to a government enterprise conducted under the express requirement of Section 161v. More recently, DOE has broadened its claim to discretion to go beyond GAAP.

²²⁷ In any event, it is far from clear that DOE's write-off would be consistent even with the original version of section 161v. For example, it is hard to argue that DOE's write-off is necessary or desirable to promote the national interest in the development and utilization of nuclear power. The only significant potential nexus between the stated interest and DOE's write-off would be potentially promotional effects on nuclear development due to lower nuclear fuel prices allowed by the write-off. But the enrichment portion of nuclear fuel costs are a relatively insignificant factor in the overall cost of nuclear power (generally less than a fraction of 1%). Moreover, cheap nuclear fuel is currently abundantly available at prices below DOE's price even after the write-off. Thus, although cheaper DOE enrichment prices might marginally contribute to lowering the overall cost of nuclear power (thereby promoting it), the chief beneficiary of the write-off would not appear to be the promotion of nuclear power but rather DOE, in that the write-off may assist in preserving or increasing DOE's share of the nuclear fuel market. However, the Atomic Energy Act nowhere identifies the preservation and expansion of the federal enrichment enterprise as a national goal. Indeed, since the Nixon Administration, the stated goal of the federal government has been to get out of the enrichment business. GAO is in accord:

Moreover, to the extent that the Joint Committee in the 1960's recognized flexibility on the part of DOE to exclude portions of the enrichment plant from depreciation and interest charges, that flexibility was confined to plants previously constructed for military purposes. The original plant constructed for military purposes was valued at approximately \$2.0 billion. According to GAO, the undepreciated balance of the original three gaseous diffusion (GD) plants as of fiscal year 1971 was about \$1.0 billion, and some \$0.7 billion of that amount had been recovered from customers by fiscal year 1983.²²⁸ The bulk of GD investment written off by DOE would thus appear to be associated with subsequent programs to upgrade the plants "to increase their capacity and efficiency, specifically to benefit civilian customers."²²⁹ The remaining investment written off by the agency relates to the gas centrifuge plant,²³⁰ another project undertaken for the benefit of civilian customers. Nothing in the legislative history suggests that DOE has discretion to write-off investment undertaken specifically to benefit civilian customers.

AEC's flexibility in not pricing for full depreciation was further constrained by the Conway Formula. The Conway Formula arose out of congressional hearings on the 1966 criteria. AEC asserted that the policy of the criteria was one of full cost recovery²³¹ with one exception. That exception was that full depreciation would not be charged during an interim period because the plants had been built for military purposes and the civilian market had not yet expanded so as to fully utilize their capacity. The formula for depreciation and interest charges for the interim period became known as the Conway Formula. This formula required recovery of depreciation and interest charges

The nuclear industry is not threatened by current uranium enrichment market conditions. . . . [I]t is not the development of atomic power that is being impeded but the ability of the United States enrichment program to compete in the world market under its legislative structure. This situation does not fall within the one exception for which Congress [in 1964] approved less than full cost recovery.

GAO Letter, *supra* note 24, at 22.

²²⁸ *Id.* at 14.

²²⁹ *Id.* The original capacity of the GD plants would be roughly adequate to serve all DOE's current military and civilian customers without the expensive CIP/CUP upgrade. But for the upgrade, capacity utilization would be much higher and much of this controversy averted.

²³⁰ Statement of Keith Fultz, *supra* note 204, at 3.

²³¹ 1966 Hearings, *supra* note 72, at 31, 32, 112.

only to the extent of plant utilization plus 10%, but with a floor of 30%. Once utilization reached 75%, 100% of depreciation and interest costs were to be recovered.

GAO reports, and DOE admits,²³² that DOE achieved 77.1% utilization from its GD plants in 1976. From that point forward, DOE was obligated to depreciate 100% of its plants under the Conway Formula. As GAO points out,

the interim period in which the Conway Formula applied . . . expired [in 1976]. Thereafter, in accordance with the Conway Formula, [DOE] should have recovered 100 percent of plant and equipment depreciation from customers regardless of the percentage of production capacity achieved in any given year. In fact, from 1977 through 1983 [DOE] did include 100 percent of depreciation in its prices, even though that percentage of production capacity never again reached 75 percent.²³³

GAO concludes that DOE's write-offs are

not in accord with the statutory mandate of subsection 161v. of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2201(v), requiring cost recovery for [DOE's] uranium enrichment program. Therefore, we conclude that the write-off would constitute a violation of the statute. . . . If such assets are to be written-off, Congress must amend the Act. A criteria change would not suffice, since the criteria must be in accord with the statute.²³⁴

GAO's conclusion is entitled to special weight. When Congress amended Section 161v. in 1970 specifically to require full cost recovery, the Joint Committee flatly declared that GAO had "correctly discerned" Congress' intent. The Joint Committee "recommend[ed]"²³⁵ that the federal enrichment enterprise consult with GAO, and indeed "expect[ed]"²³⁶ federal enrichment officials to consult with GAO, prior to any revision of the enrichment criteria. In a way, GAO is Congress' designated exegete of the full cost recovery requirement. Its opinion concerning DOE's compliance with the full cost recovery require-

²³² 51 Fed. Reg. 27140 (1986) (to be codified at 10 C.F.R. pt. 762).

²³¹ GAO Letter, *supra* note 24, at 22.

²³⁴ *Id.* at 13, 22.

²³⁵ H.R. REP. NO. 91-1470, 91st Cong., 2d Sess. 25, *reprinted in* 1970 U.S. CODE CONG. & ADMIN. NEWS 5005.

²³⁶ *Id.* at 32, 33.

ment in Section 161v. should be entitled to appropriate deference.

In short, the consistent and congressionally-approved interpretation of Section 161v. and the enrichment criteria as to recovery of cost within ten years is entitled to deference²³⁷ and thus places DOE in an awkward position. DOE's recent revisionist interpretations of the Conway Formula are not consistent with prior construction, or with themselves. The agency has relied upon the Conway Formula both to vindicate charging its customers depreciation on the GD plants if it chooses to do so,²³⁸ and as a legal basis to take write-offs notwithstanding the full cost recovery requirement.²³⁹ It appears that DOE has taken action inconsistent with the full cost recovery provision of Section 161v. with respect to roughly \$4.0 billion in taxpayer assets.²⁴⁰

4. A Word on Unrecovered Costs

Controversy raged throughout 1984 and 1985 concerning the amount of unrecovered costs currently extant with regard to the uranium enrichment program. As late as December of 1985,

²³⁷ A consistent agency interpretation is highly persuasive as to the meaning of a statute. See, e.g., 2A SINGER, STATUTES AND STATUTORY CONSTRUCTION § 49.07 at 393 (Sands 4th ed. 1984). This is especially so where Congress has specifically noted (see, e.g., H.R. REP. NO. 91-1470, 91st Cong., 2d Sess. at 25, reprinted in 1970 U.S. CODE CONG. & ADMIN. NEWS 5005) that construction with approval when amending the statute. Compare *United States v. Group*, 459 F.2d 178, 182 (1st Cir. 1972) (weight given to administrative interpretation not upset by subsequent amendment of statute) with *Public Serv. Co. of New Hampshire v. NRC*, 582 F.2d 77, 83 (1st Cir. 1978), cert. denied, 439 U.S. 1046 (1979) (rule applied in Atomic Energy Act context). There are cases holding that an agency is entitled to no deference when it abandons an earlier consistently held view. See, e.g., *Atchison, T. & S.F. Ry. Co. v. United States*, 209 F. Supp. 35, 41-42 (N.D.Ill. 1962).

²³⁸ See 51 Fed. Reg. 27140 (1986) (DOE rebuts Duke Power argument that the agency is required under the Conway Formula *not* to charge for unused plant.).

²³⁹ DOE argues that Joint Committee toleration of the Conway Formula after 1970 despite the 1970 amendment to the statute establishing cost recovery as DOE's pricing basis indicates that DOE has flexibility to "write-off" investment. See *id.* at 27138; see also Business Panel, *supra* note 2, at 75 (Statement by Mr. Brewer). But there is an easy response. The Conway Formula envisioned the ultimate recovery of *all* costs. It did not envision permanent non-recovery, which is precisely what is contemplated in a "write-off."

²⁴⁰ DOE officials from time to time have suggested that their European competition benefits from Government subsidies, such as "very, very favorable financing from their Government." See, e.g., Business Panel, *supra* note 2, at 55. The write-off by DOE of billions of dollars of federal investment in the form of capital expenditures and imputed interest could readily be construed to be "very, very favorable financing" for DOE from the United States Government and may raise problems under GATT for some DOE export sales.

DOE's position with respect to unrecovered costs was unclear. At one point, DOE reportedly suggested that those costs were much less than it currently admits and, more particularly, that the sum which it should ultimately return to the Treasury was only \$788 million.²⁴¹ The basis for this amount is not clear but it is approximately the undepreciated investment in GD plants after DOE's original \$1.2 billion GD write-off.²⁴² The question of the amount of unrecovered costs was resolved within the Executive Branch in January of 1986, when both the Office of Management and Budget (OMB) and DOE acknowledged GAO's \$7.5 billion figure.²⁴³

The \$7.5 billion figure, however, does not enjoy the concurrence of the nuclear utility industry. William Lee, a spokesman for the nuclear utility industry and the Chairman of Duke Power Company, contends that the debt is only \$355 million — an amount which he evidently believes is equivalent to the total of net appropriations over the history of the commercial enrichment program minus the full cost of supplying enriched uranium to

²⁴¹ See, e.g., *INSIDE ENERGY* (McGH) 3 (Dec. 16, 1985).

²⁴² According to the staff of the House Interior and Insular Affairs Committee, DOE derived the figure as follows:

Total Appropriations	
in Millions	For FY 72-84
Operating and other costs	\$ 9,967
CIP/CUP	1,479
GCEP	2,709
Total	14,155
Minus (military requirements)	1,180
Minus (revenues)	12,188

\$787, rounded to \$788.

The DOE figure does not account for \$4,049,000,000 in imputed interest and contains a somewhat higher figure for military requirements than that espoused by, for example, OMB. Private communication from Mr. Joseph Shorin to the author, Jan. 1986. According to staff for the Interior and Insular Affairs Committee, DOE essentially called for the write-off of \$3.5 billion for GCEP since the agency argued that it was paid for from revenues received as imputed interest. *Id.* But the imputed interest used for GCEP is arguably equivalent to a positive net appropriation in that amount.

²⁴³ OMB, *supra* note 17; 51 Fed. Reg. 3629 (1986) (to be codified at 10 C.F.R. 762); see also *id.* at 15635. Part of the confusion concerning DOE's unrecovered costs stems from the use of three different accounting systems: a financial statement system, the pricing system, and the appropriation system. DOE uses the financial statement system to provide financial accounting for the system. The appropriation system is used by Congress to control program spending. The pricing system is used to determine price. The three systems are quite different, although interconnected. For further details, see Civiak (Cong. Research Service), *Cost Accounting, Pricing and Cost Recovery in DOE's Uranium Enrichment Program* (Oct. 9, 1985).

defense programs over that period.²⁴⁴ In fact, the utility industry contested the larger sum in DOE's rulemaking concerning revised uranium enrichment criteria, contending that the entire amount should be forgiven on the theory that this was the intent of Congress in approving DOE's annual appropriations over the years.²⁴⁵

The bulk of the unrecovered costs is in the form of imputed interest. Although DOE and its predecessors purported to charge for imputed interest,²⁴⁶ revenues from the sale of enriched uranium have not been used to repay imputed interest to the Treasury. Instead, the agency, with Congress' consent, reinvested receipts in the enrichment program, chiefly to finance the upgrade of DOE's GD facilities and to build the now-cancelled gas centrifuge.²⁴⁷ Moreover, to the extent that the government did

²⁴⁴ Letter from William Lee to Chairpersons Fuqua, Udall and Lloyd (Sept. 27, 1985); see also Letter from Mr. Carr (Assistant G.C. of Duke Power) to Messrs. McRae, et al., (DOE) (Feb. 24, 1986). Chairpersons Fuqua, Udall and Lloyd responded to Mr. Lee by a letter dated November 6, 1985, noting that GAO "reports that there is an unrecovered balance in the enrichment program in excess of \$6 billion. Most of this balance (\$4.6 billion) is due to federal investments after 1971," i.e., for commercial purposes. Although the three Representatives agreed that some adjustment for services to the defense sector "may be appropriate," they noted that "it is clear that a significant sum would still be owed to the government." They added that "we . . . believe that all costs to the government should eventually be recovered." See NUCLEAR FUEL 8 (Dec. 1, 1985). Staff for the Interior and Insular Affairs Committee indicate that Mr. Lee has ignored imputed interest. Private communication from Mr. Joseph Shorin to author (Jan. 1986). Duke Power Company has filed a petition for review of DOE's July 29 enrichment criteria. See *Duke Power Co. v. Department of Energy*, No. 86-1522 (D.C. Cir. filed Sept. 22, 1986) (DOE has moved to dismiss on the ground, among others that the Court of Appeals lacks jurisdiction under 42 U.S.C. § 2239 and 28 U.S.C. § 2341.).

²⁴⁵ Letter from Mr. Kearney (EEI) to U.S. DOE (Feb. 28, 1986). The utilities are also pressing Mr. Lee's argument that more of the investment should be attributed to defense or research and development. See, e.g., Letter from Mr. Carr to Messrs. McRae, et al., (Feb. 24, 1986). DOE seems unimpressed with this position. See 51 Fed. Reg. at 15636 & n. 4 (1986) (arguing that Government customers have been imputedly charged rates equivalent to commercial customers).

²⁴⁶ GAO has indicated that DOE and its predecessors may have been undercharging their enrichment customers for a prolonged period. See GAO, "Information on DOE's Costing and Pricing of Uranium Enrichment Services" 10, reprinted in 1983-84 Hearings, *supra* note 145, at 285 (DOE has not recovered costs in 9 out of 13 years between FY 1971 and 1983; total costs per SWU in 1983 were \$181.79 but average price only \$143.90).

²⁴⁷ DOE is not open concerning what it has done with the revenues which it has received from the enrichment program. The following exchange is illustrative:

Question 10: A. Exactly how much money in imputed interest charges has DOE collected from its customers?

B. Why hasn't the Department returned imputed interest collected from its

overbuild, the nuclear utilities cannot claim to have been innocent bystanders. As the National Taxpayers Union has stressed, the utilities urged the government to build the now unnecessary enrichment facilities, arguing that "the economic penalties that could be imposed by a shortfall of enrichment capability far exceed the costs that would be associated with a temporary oversupply. . . ." ²⁴⁸

The most succinct recent summation of the various positions of the key parties is a DOE memorandum entitled "Unrecovered Government Investment." It explains the situation as follows (figures in millions):

	Nuclear Utility Industry	DOE	GAO
1969 beginning balance	0	150	1500
net cash flow	1600	1600	1600
(i.e., net positive appropriations from Congress)			
adjustment for unfunded government deliveries	(1470)	(1200)	(1200)
(i.e., defense enrichment)			
imputed interest	220	5600	5600
	350	7500	7500
adjustments (i.e., write-offs)	0	4100	0
admitted unrecovered costs	350	3400	7500

This summary is misleading only in that it suggests that the utilities contend that the original plants were "transferred" in

customers to the Treasury to offset the government's cost of borrowing, as prescribed by the General Accounting Office's Policy and Procedures Manual for Guidance of Federal Agencies?

C. Precisely where in the program has DOE reinvested imputed interest revenues?

Answer: From 1969 through 1984 we have imputed interest costs of \$4,168 million. The revenues received from the recovery of imputed interest costs were directed by Congress in appropriation acts to offset enrichment program costs.

Letter from R. G. Rabben (DOE) to Chairman Udall (December 13, 1985).

²⁴⁸ *Hearings Before the Energy and Env. Subcomm. of the House Comm. on Interior and Insular Affairs*, 99th Cong., 2d Sess. 3 (1986) (statement of B. Jeanine Hull

1969 for free. Although some may take that position, the more general view seems to be that a more complicated disavowal of responsibility for investments incurred subsequent to 1969 (in the form chiefly of recycled imputed interest and appropriation).

5. Congress

Congress has yet to come to grips with the situation that has developed. Aside from efforts to determine what is happening (no easy task given the difficulty associated with assembling information in this area), Congressional concern to date has tended to focus on: whether to require some initial payback of the government investment and, if so, how much.²⁴⁹ The payback of any arbitrary amount may not actually reduce the amount of unrecovered costs.²⁵⁰ The only method to assure a reduction in unrecovered costs is to require repayment of all the annual imputed interest in each fiscal year, plus a portion of the underlying balance. In other words, the enrichment debt, if it is to be paid off, must be handled in the same fashion employed by

(NTU) quoting testimony of Mr. Kuhns on behalf of the Edison Electric Institute in *Future Structure of the Uranium Enrichment Industry: Hearings Before the Joint Comm. on Atomic Energy*, 93rd Cong., 2d Sess. 175 (1974)); see also 1978 Hearings, *supra* note 10, at 80, 87, 444 (EEI statements in favor of gas centrifuge and opposing GAO suggestion that investment in additional enrichment capacity be postponed); 1983-84 Hearings, *supra* note 145, at 315-26 (EEI continues to support construction program).

²⁴⁹ For example, the original Senate budget reconciliation proposal in 1985 called for a payment by the enrichment program to the Treasury — presumably in the form of a net negative appropriation — of some of “the estimated \$4.6 billion over the next three years.” S. CON. RES. 32, 131 CONG. RES. 3424 (1985); see also S. REP. No. 99-15, 99th Cong., 1st Sess. 93 (1985) (the Senate, in 1985, assumed that \$4.6 billion was the government’s post-1971 investment in the uranium enrichment program).

²⁵⁰ In the words of Mr. Civiak of the Congressional Research Service, [t]he repayment of prior investment is determined through the price setting . . . system. . . . A negative net appropriation, without a change in the method of pricing of enrichment services, is not enough to ensure reducing the Government investment in enrichment. The Government investment in enrichment could increase or decrease depending upon how the . . . excess of revenues over obligations [needed to make the repayment] is produced. It might be possible to achieve a negative net appropriation by selling inventories of enriched uranium and reducing capital spending over the period, while the net investment in enrichment grows from operating income on the balance sheet and/or continued accumulation of imputed interest on the Government investment—neither of which show up as obligations in the appropriate system.

Civiak, *supra* note 243, at 8, 9.

bank or mortgage company which requires payment of annual interest as well as a portion of the balance due with respect to a customary home mortgage.

A much broader set of questions, however, faces Congress. These include: whether to allow a write-off of some of the \$7.5 billion in unrecovered costs and, if so, how much; whether to require DOE to recover future costs; how to provide effective oversight and guidance for the agency; and how to prevent DOE from again falling into a position like its current one.

Aside from the possible suspension of DOE's revised criteria, the only consideration to date which Congress has afforded these issues is in the context of Senator Domenici's proposed "Uranium Revitalization and Tailing Reclamation Act of 1982."²⁵¹ This bill, in its last extant version, would have legislatively approved DOE's new enrichment contract and would have adopted it as DOE's new criteria. The bill would also have amended Section 161v. to make cost recovery a secondary priority in favor of maximization of agency market share. In addition, the proposal would have established a cost allocation formula under which utilities and uranium mill operators would have shared the expenses of reclaiming existing uranium mill tailings. The proposal further would have required utilities to purchase approximately 50% of their uranium requirements domestically. The bill largely endorsed DOE's current policies, except insofar as it would have shifted about \$3.4 billion from the Treasury to domestic uranium producers in the form of tailings and import relief, and to DOE enrichment customers (both foreign and domestic) in the form of reduced enrichment prices. Earlier versions of the proposed legislation have been opposed by the Administration as well as by the utility industry, chiefly because of the de facto transfer of funds to domestic uranium producers in the form of tailings and import relief.²⁵² In addition to the controversy on tailings and import relief,²⁵³ the proposed legislation poses a number of potentially more weighty concerns. For example, despite resolving the question of discretion to take write-offs and pursue market

²⁵¹ S 1004, 99th Cong., 1st Sess. (1986).

²⁵² See *Hearing Before the Subcomm. on Energy Research & Dev. of the Senate Energy and Natural Resources Comm.*, 99th Cong., 2d Sess. 3 (1986) (statement for the Record submitted by Edison Electric Institute).

²⁵³ The bill was the subject of negative editorials principally on grounds of import relief in the *Washington Post*. *Washington Post*, Oct. 16, 1986, at A20.

share goals at the expense of cost recovery in favor of DOE, the bill does nothing to address GAO's concerns about the need to provide effective guidelines for purposes of oversight of DOE's management of the program. Although the bill was reported by the Senate Energy and Natural Resources Committee, it failed to reach the Senate floor prior to adjournment of Congress.²⁵⁴

IV. SOME POLICY OPTIONS

Before one can analyze the merits of the statutory revisions, one must develop some sense of what purpose DOE's enrichment program is intended to serve.²⁵⁵ This question is very complex and can be approached from a number of directions. The simplest approach is by analysis of the three basic enrichment pricing options available to DOE. These three options are: (1) to price above cost (*i.e.*, for profit); (2) to price below cost (*i.e.*, to subsidize); and (3) to price at cost. DOE is currently barred by law from pricing above²⁵⁶ or below²⁵⁷ its costs. However, one may still ask what policies would be served thereby, and whether either option might reasonably be expected to be realistically maintainable.

Pricing for a profit would foster a number of potential objectives. For example, it could raise revenues for a government deeply in deficit. It could encourage the development of alternative sources of supply, which might further the professed objective of "privatization." But pricing at a profit would be difficult to reconcile with a number of other important interests. For example, profit-taking may tend to encourage the development of foreign sources of supply. This might be viewed as contrary to United States' nuclear non-proliferation objectives. In addition, if the costs of enrichment are set so high as to significantly increase the cost of nuclear power, the approach

²⁵⁴ According to the Washington Post, the Administration threatened to veto the Continuing Resolution if the Appropriations Committees attempted to "write-off" additional enrichment debt. See Washington Post, Oct. 15, 1986, at 417, col. 5. This threat would presumably also extend to the "Uranium Revitalization and Tailings Reclamation Act."

²⁵⁵ Congressmen Udall and Seiberling wrote GAO on July 30, 1985, requesting an "assessment of the costs and benefits to the United States of various uranium enrichment objectives." Letter from Congressmen Udall and Seiberling to Mr. Charles Bowsher (July 30, 1985). Such an assessment is long overdue.

²⁵⁶ 42 U.S.C. § 2201v (1982).

²⁵⁷ 42 U.S.C. §§ 2201v & 2209 (1982).

arguably would be inconsistent with the basic Atomic Energy Act purpose of encouraging the development of that form of energy.²⁵⁸ Where one comes out on this balancing of interests may be of only theoretical value: DOE takes the position that it cannot even recover its capital investment in the federal enrichment enterprise due to foreign competition. This implies that there is no possibility of extracting a profit at least in the near term.

Pricing below cost might also foster a number of potential objectives: it could perhaps (1) increase U.S. enrichment export sales and thus reduce the balance of trade deficit; (2) enhance employment in the enrichment industry; (3) encourage the development of civilian nuclear power by lowering nuclear fuel prices; (4) foster U.S. energy independence by encouraging domestic utilities to shun foreign supplies; and (5) assist in discouraging the development of foreign uranium enrichment facilities and thus serve nuclear non-proliferation objectives.

Subsidization, however, has a number of drawbacks. First, the subsidy must come from someone. Subsidization means either raising taxes, sustaining a higher deficit (*i.e.*, borrowing), or transferring funds from some existing program to partially support the enrichment program's costs. It is not clear whether the interests stated in favor of subsidization would be sufficient to warrant any of these steps for this particular industry.²⁵⁹ Second,

²⁵⁸ 42 U.S.C. § 2013(d) (1982).

²⁵⁹ The various justifications offered for subsidizing the U.S. enrichment enterprise, including assistance with respect to the U.S. balance of payments; provision of employment, and energy independence, are not compelling. First, the trade in enrichment services is relatively small. Even if all civilian U.S. enrichment requirements were satisfied abroad, there would be only a negligible impact on our overall trade deficit. See Statement of Keith Fultz, *supra* note 204, at 8. Second, if the United States is not competitive, and we wish to reduce any trade deficit in the area of enrichment, then the Government must either subsidize our enrichment enterprise or impose quotas or tariffs to impede entry of foreign enrichment services. But unless relief is invoked pursuant to existing trade remedies (the applicability of which remain to be demonstrated), such measures would likely be viewed as interference with free trade in contravention of U.S. trade policies and GATT obligations. In any event, subsidies or quotas might lead to demands for compensation under GATT, and, if compensation were denied or deemed inadequate, to costly foreign retaliation against other U.S. products. The argument concerning employment is similar to that relating to balance of trade. It implies support either for a subsidy or a barrier to imports, both of which present trade potential policy problems. The argument relating to energy independence is also weak. Energy independence is certainly a frequently evoked benefit said to be associated with reliance on nuclear power. But it is particularly difficult to invoke energy independence in the area of nuclear fuel

the subsidy would presumably run to foreign utilities as well as domestic utilities. It would be ironic indeed for U.S. taxpayers

years. It is particularly difficult to invoke energy independence in the area of nuclear when the domestic uranium industry complains that the Government has taken pains to avoid effective measures to check growing American dependence on foreign sources of supply for uranium. See Yokell & DeSalvo, *The Uranium Default: Westinghouse and the Utilities*, PUB. UTIL. FORT., Feb. 7, 1985, 20, 24 (most U.S. needs will be supplied from non-U.S. sources). See generally *Review of the Statutes of the U.S. Domestic Uranium Mining and Milling Industry, Hearing Before the Energy Res. & Dev. Subcomm. of the Senate Energy and Nat. Res. Comm.*, 98 Cong., 2d Sess. (1984). Moreover, the existence of national policy favoring energy independence in the nuclear fuel area is clouded by the existence of moratorium imposed by a number of states on uranium development. See Rosenberg, *Uranium Mining and Milling in Virginia: An Analysis of Regulatory Choice*, 4 VA. J. NAT. RES. L. 81, 123-125 (1984) (New York, New Jersey, Vermont, and Virginia currently employ such restrictions).

The interest in enhancing U.S. ability to attain non-proliferation objectives is a more appealing concern with respect to DOE pricing policy. The basic U.S. non-proliferation objective is to avoid the spread of nuclear weapons. See Scheinman, *An Evaluation of Non-Proliferation Policies: Retrospect and Prospect*, 4 N.Y. L. SCH. J. INT'L & COMP. L. 335 (1983). From one perspective, this policy "Looks like the most frustrating effort since the tidal policies of King Canute." Nye, *Maintaining a Non-proliferation Regime*, 35 INT'L ORG. 15 (1981). The policy might be more modestly defined as reducing the rate or degree of proliferation in order to cope with destabilizing effects. *Id.* There are limits on the ability of U.S. enrichment policy to support non-proliferation policy, because, among other things, the decision of a foreign government to proliferate "is, of course, eminently political." *Id.* at 362-63. However, the ease of the decision to proliferate is in part a function of the availability of technology, facilities and material. *Id.* at 363. If the United States is a reliable supplier of enrichment, there is less reason for other nations to develop their own enrichment facilities and the decision to proliferate is thus arguably more difficult for them. Moreover, assurance of enrichment services from the United States can be used as an inducement to encourage other nations to cooperate in non-proliferation efforts. Stoiber, *Current United States Nuclear Non-Proliferation Policy*, 4 N.Y. L. SCH. J. INT'L & COMP. L. 337, 371 (1983); see also Nye, *supra*, at 30-31 (suggests international fuel bank); 1983-84 Hearings, *supra* note 145, at 140 (statement by Mr. Civiak of CRS). The notion that the United States should be a reliable supplier of enrichment is codified in section 2(b) of the Non-Proliferation Act, 22 U.S.C. § 3201(b) (1982), which provides that the United States shall "take such actions as are required to confirm the reliability of the United States in meeting its commitments to supply nuclear . . . fuel to nations which adhere to effective non-proliferation policies. . . ." But these observations do not lead to any specific conclusion concerning the desirability of subsidizing enrichment services. Section 161v. of the Atomic Energy Act, 42 U.S.C. § 2201(v) (1982), bars DOE sales of enrichment services to foreign entities at prices less than those charged domestics and specifically requires full cost recovery for all sales. It thus forbids subsidization, particularly of foreign buyers of enrichment. This suggests that the U.S. non-proliferation policy has never before extended so far as to support subsidization of enrichment sales abroad in order to curtail a potential foreign proliferator's access to enrichment facilities. Moreover, as a practical matter, most foreign countries (e.g., U.K., France, Germany, Japan, Italy, Spain, Belgium and the Netherlands) with sizeable nuclear electrical generating capacity have developed, have participated in the development of, or intend to develop their own enrichment capacity, and DOE enrichment policies will now have little effect in terms

to subsidize foreign energy supplies at the same time the United States is facing record trade deficits. In short, it is doubtful that a subsidy for enrichment would be politically acceptable, at least if taxpayers understood that a subsidy was occurring.

Pricing at cost is a politically defensible position. As long as DOE is efficient (and can thus price at market levels), the program should foster nuclear non-proliferation objectives, assist with respect to the balance of trade, and provide some employment. Pricing solely to cover costs does not involve subsidization and is unlikely to generate meaningful political opposition, except insofar as it denies opportunities for private profit. While it is true that cost-based pricing may conflict with "privatization" objectives, this undesirable aspect could conceivably be mitigated by appropriate commitments to make the next round of technology available for exploitation by private suppliers.

Even if pricing at cost appears reasonable, one must inquire whether it is sustainable in the current market environment. More precisely, the U.S. economy is presumptively based on a free market ideology in which only the economically efficient survive. Since DOE is purportedly the world's highest cost en-

of deterring these activities. The principal impact of DOE enrichment policies will be on countries whose nuclear electrical generating capacity is relatively small and whose principal interest in developing enrichment capacity would be to export enriched uranium (presumably for a profit) or to support a nuclear weapons program. DOE pricing policies are likely to have minimal influence on a potential proliferator developing enrichment capacity for weapons purposes, because that country's primary motivation is nationalistic or ideological, not economic. DOE pricing policies, however, might influence a country seeking to justify enrichment capacity on the basis of projected export earnings. Put another way, if DOE's prices become significantly higher than those expected to be incurred by a potential proliferator, the potential proliferator may find it commercially attractive to build its own facility. In short, the strongest statement one can make in favor of below cost pricing, non-proliferation goals might arguably be marginally better served, at least from time to time, by allowing DOE to subsidize sales to foreign concerns.

Whether a subsidy in fact would be effective at all in deterring construction of additional enrichment facilities is a complex question which is probably impossible to answer with any certainty as a general matter. Suffice it to say here that it is not clear that a sufficient domestic political consensus could be assembled to make a commitment to provide subsidies which would appear believable to a foreign government, especially over a significant period of time and especially in view of the fact that the United States would be subsidizing a basic input into foreign products against which it frequently has competitive difficulties. To further complicate the issue the capital cost of enrichment facilities is expected to decline sharply with the advent of AVLIS technology. If this technology spreads, cost-competitive enrichment facilities may soon be in reach of many more governments, and the utility of DOE's enrichment enterprise in achieving nuclear non-proliferation objectives may thus be further weakened.

richer,²⁶⁰ this raises the question whether the DOE enrichment enterprise is sufficiently competitive to remain in the commercial market, even if it prices only at cost. In the phraseology of international economics, perhaps the United States (or at least the DOE) does not enjoy a comparative advantage in uranium enrichment and should therefore "get out."

Some justification for a continued U.S. presence in the nuclear fuel market on grounds of economic efficiency exists, but it is a justification based on the future rather than the current time. Although the United States enrichment enterprise as recently conducted does not appear to be competitive,²⁶¹ the same cannot be said for the new AVLIS technology being developed by Lawrence Livermore Laboratory. Lawrence Livermore suggests that a one million SWU enrichment facility relying on laser isotopic separation could be in operation by the early 1990's and could provide enrichment at a "probable cost of \$25 per SWU."²⁶² If the optimism is borne out, the United States may well be highly competitive in approximately ten years if AVLIS is deployed, notwithstanding DOE's current non-competitive position.

The strongest grounds on which to espouse diverging from full cost recovery would be that any effort to recover all costs would cost taxpayers more than alternatives. Posing the issue in this fashion raises some very specific questions about DOE's current approach to managing its program. DOE's current program goals are in essence to reduce the agency's costs as much as possible and to cut the agency's price as much as possible with an evident intent of maximizing market share.²⁶³ But as

²⁶⁰ Business Panel, *supra* note 2, at 14.

²⁶¹ The U.S. GD program appears to be competitive but for the excess baggage of what in retrospect were unnecessary capital investments and long-term take-or-pay electricity contracts with TVA. DOE's "variable cost" for additional SWU's from its GD plants is within range of the estimated probable cost of AVLIS SWU's.

²⁶² *Hearing Before the Energy and Environment Subcomm. of the House Comm. on Interior and Insular Affairs*, 99th Cong., 1st Sess. 56 (1985) (statement by John L. Emmett). DOE's Process Evaluation Board (PEB) estimated AVLIS cost at \$52-\$60 using "multi-variate sensitivity analysis." DOE, *Uranium Enrichment Technology Evaluation and Assessment*, Executive Summary 1-9 (May 15, 1985).

²⁶³ See Business Panel, *supra* note 2, at 82, 83 (testimony of T. Robert Wolcott, Chairman of Nuexco). For example, DOE in April 1985 offered an "incentive price of \$90 per SWU to customers with uncommitted sales in FY 1987 through FY 1990." This "incentive pricing offer proved very successful . . . nearly 87 percent of [DOE's] customers with uncommitted requirements accepted. . . ." *Hearing Before Energy & Env. Subcomm., House Int. & Ins. Affairs Comm.*, 99th Cong., 1st Sess 5 (1985) (testimony

GAO has noted, this program is dependent on write-offs of DOE plant investments and will not result in the full cost recovery intended by the statute in the near term. Whether costs may be recovered in the future may hinge on the commercial availability of AVLIS. However, even if AVLIS is deployed in the next decade, an opportunity to recover costs may not arise if competition from foreign laser isotopic facilities forces down prices. In short, DOE's current emphasis on maximizing market share may be inconsistent with full cost recovery not only in the short term but in the long term as well.

An alternative and arguably more reasonable approach for the agency would be to emphasize maximization of enrichment revenues. DOE admits that it is *not* doing this for the next five years²⁶⁴ and it is reportedly not the agency's policy for the 1990's either.²⁶⁵ Maximization of revenues does not mean price gouging. It does mean trying to cover not only variable costs (such as labor and electricity) but also as many fixed costs (depreciation and imputed interest) as possible. While it may not be possible to recover all fixed costs using this approach, the unrecovered investment remaining at the time AVLIS becomes available will be minimized. Put another way, the net subsidy by U.S. taxpayers to the enrichment program will be minimized. Although it may lose some business using this approach, the agency will minimize its losses and in this sense be "competitive." Additionally, the agency will be better able to "privatize" the program.

Whether DOE would lose more than it would gain in pricing to recover more of its costs depends on the elasticity of demand for enrichment services. This in turn depends on a number of factors. These include the loyalty of DOE's customers to the

of John R. Longenecker (DOE)). Doe has subsequently offered an \$85 per SWU incentive price.

²⁶⁴ *Hearing Before the Energy and Env. Subcomm. of the House Interior and Insular Affair Comm.*, 99th Cong., 1st Sess. (1985) (prehearing Question and Answers Propounded by Chairman Udall to DOE; DOE Answer to Udall Question 10: "revenues would be \$330 million higher over the 1986 to 1990 period by maintaining our existing [\$135/SWU] selling price [as opposed to the new \$125/SWU price]").

²⁶⁵ DOE apparently is offering "incentive prices" of \$85/SWU escalated by the impact price deflator for the U.S. gross national product for 1991-95. Moreover, DOE has produced some price projections indicating that the base price under the utility services contract may be close to \$100/SWU around 1991. See NUCLEAR FUEL 3 (Dec. 16, 1985).

agency;²⁶⁶ the differential between foreign and domestic SWU prices; the availability of excess capacity abroad; the likelihood of timely construction of additional foreign capacity; and the amount of uncommitted demand which could fill such excess capacity as currently exists outside the United States. These latter points merit scrutiny. According to Congressional Budget Office estimates, which generally conform to DOE figures,²⁶⁷ there are currently about 5 to 6 million SWUs per year of excess capacity in Europe.²⁶⁸ This amount is expected to erode to only about 2 to 3 million SWU's by 1990.²⁶⁹ Similarly, there are approximately 6 million SWU's of demand projected for the 1990's that are uncommitted.²⁷⁰ If this is correct, the uncommitted demand would readily balance out foreign excess capacity available in the 1990's—the time period in which DOE fears the loss of significant business. Under these circumstances, DOE could now price to recover more of its costs and would not lose significant business, even if priced at levels which approached full-cost recovery, unless foreign interests could rapidly construct additional capacity. A major expansion of existing foreign GD or gas centrifuge capacity seems unlikely, however, in face of DOE's projected lower-cost AVLIS technology.²⁷¹ In short, DOE possesses a degree of market power, at least on the margin. Put another way, it would appear under the stated facts that business would be forced to patronize DOE even if DOE priced its enrichment services at levels higher than EURODIF or URENCO. This suggests that DOE may be able

²⁶⁶ See Business Panel, *supra* note 2, at 84 (Nuexco Chairman questions whether U.S. utilities would "seriously hurt" — desert — DOE); 1983-84 Hearings, *supra* note 145, at 72 (Nuexco questions whether demand for uranium enrichment is responsive to price). *But see id.* at 313, 314 (George Rifakes of Commonwealth Edison asserts that domestic utilities have gone to non-DOE sources for short-term price benefits even though there are "potential . . . long-term costs" in doing so.).

²⁶⁷ See Business Panel, *supra* note 2, at 51-52.

²⁶⁸ CBO, *supra* note 2, at 2.

²⁶⁹ Compare *id.* at 15 (Eurodif and Urenco capacity static) with *id.* at 17 (Eurodif demand at 8 million SWU).

²⁷⁰ *Id.* at 14.

²⁷¹ DOE claims that it must cut its prices in order to "bring in an additional \$7 billion in revenues," evidently from 1991 through the year 2000, because its customers "will begin to leave DOE in 1991 and will totally leave DOE by the year 2000" if the agency maintains prices "at FY 1985 levels [*i.e.*, \$135/SWU]". See *Hearings Before the Energy and Env. Subcomm. of the House Interior and Insular Affairs Comm.*, 99th Cong., 1st Sess. (1985) (DOE Answer to Udall Question 10). DOE's analysis, however, seems to assume a worst case, does not address the question of where DOE's customers will go in the 1990's, and appears to overlook the factors indicated in the test. See also Bujon, *supra* note 10, at 9.

to recover all, or at least more of, its costs than it currently anticipates. Clearly the question of elasticity of demand for DOE's enrichment product —especially in the 1990's— and the continued desirability of full cost recovery are key issues for Congressional policy-makers to explore.

If DOE in fact cannot recover the taxpayer's seven billion dollar plus investment in the federal enrichment enterprise, Congress is faced with some potentially troublesome decisions. Either it will have to accede to what in effect is a multi-billion dollar subsidy to domestic and foreign nuclear utilities, or it will have to come up with alternative means to raise the money. Neither result is a happy one. Utilities and their ratepayers will argue that they should not be burdened with costs attributable to a misconceived and overly corpulent government enrichment program. Taxpayers can argue that they should not bear the costs of a program to benefit the utilities when a basic ground rule of the program has always been that the utilities would bear the costs and especially when the utility industry actually encouraged the investment in enrichment facilities for which a write-off is now sought.

Assuming Congress wishes to place at least a substantial portion of the \$7.5 billion dollar cost on the beneficiaries of the enrichment program, and assuming that DOE cannot do so through its current SWU prices, there are basically two alternatives. First, U.S. utilities might be required to procure a substantial portion of their needs from DOE (i.e., an import restriction) so that DOE could recover its costs without loss of business.²⁷² However, it may be difficult to square such an import limitation with the United States' obligation not to impose new barriers to international trade under GATT. Moreover, this approach would have to be carefully tailored to maintain or create new incentives for DOE to act more efficiently. Second, the billions needed could be raised by a kind of excise tax on nuclear generated electricity. The fee per kilowatt-hour approach

²⁷² DOE arguably has authority under sections 161(b) & (p) of the Atomic Energy Act, 42 U.S.C. § 2201(b) & (p) (1982), to implement any of the purposes of the Act. To the extent that enrichment cost recovery is a purpose of the Act, DOE would arguably have power to compel its domestic customers to procure DOE enrichment services to this end. *Cf. Westinghouse Elec. Corp. v. United States*, 598 F.2d 759, 769, 776-77 (3d Cir. 1979) (NRC has broad authority under section 161(p) of the Atomic Energy Act to implement various Atomic Energy Act objectives outside the "health and safety" area).

employed by the Nuclear Waste Policy Act for financing the disposal of spent nuclear fuel offers a possible model.²⁷³ Such an approach would be acceptable under GATT. Moreover, since it in no way limits importation of enriched uranium, it would maintain all existing competitive pressures on the federal enrichment enterprise to remain efficient. However, there are negative features to this approach, for it would visit upon domestic utilities the costs of what in retrospect were mistaken investments. These investments were made not only for the benefit of domestic utilities, but for the benefit of foreign utilities as well. Moreover, to the extent it was, as the DOE now states, "the wrong thing for the country . . . [a] government mistake we should not have made," one may question whether the utilities should bear all the burden.²⁷⁴

Over and above the question of costs, there is the question of accountability: how the enrichment program should be structured so that its overseers know what DOE is doing and that DOE does what it is supposed to do. To a large extent, the criteria requirement of Section 161v. was to assist Congress in achieving this purpose. It is increasingly clear that the criteria are not a workable mechanism to attain this objective absent the oversight of the powerful Joint Committee. Some alternative means of effective oversight and guidance must be provided. Perhaps the answer lies outside Congress in the form of various proposals to "privatize" the enrichment business, or at least to establish some kind of separate entity to run the program.²⁷⁵

²⁷³ See 42 U.S.C. § 10222(a)(2) (1982) (1 mil/kwh to generate the estimated \$20 billion required for disposal facilities designed, constructed and managed by the federal government).

²⁷⁴ See *U.S. Uranium Enrichment Program Said Mismanaged*, Wash. Post, March 11, 1986, at D4, col. 1 (statement of DOE Dep. Assis. Sec. Longenecker). As noted, however, the National Taxpayers Union (NTU) has pointed out that representatives of the nuclear utility industry actively supported and even solicited the "mistake" in question.

²⁷⁵ The idea of an "independent entity . . . removed from regular government functions" and organized as a business enterprise is hardly a new solution to the problem of managing DOE's enrichment program. See Hosmer, *The Future of Uranium Enrichment*, PUB. UTIL. FORT., March 26, 1981, 13, 17; see also Business Panel, *supra* note 2, at XVI-XVII. Legislation to establish a public/private "United States Enrichment Corporation" was discussed in 1971-74. Legislation to establish a wholly private enrichment corporation was considered in 1975-78. Hosmer, *supra*, at 14. These proposals foundered in the face of the federal government's overcapacity and the apparent perception (a) that the existing government program was efficient and could provide enrichment services more cheaply than alternative suppliers, (b) that additional competition was unnecessary to encourage lower prices, and (c) that the uranium fuel cycle was soon

The real questions relating to DOE's enrichment policies and problems are only beginning to be asked. It remains to be seen how (or even if) the questions will be resolved. And equally important, it remains to be seen whether, and how, a viable program will emerge for the future.

going to be obsolete (*i.e.*, that enrichment would not be important because of future reliance on breeder reactors and the plutonium fuel cycle). *See id.* at 17. Mr. Hosmer, a former ranking Member of the Joint Committee and the first President of the American Nuclear Energy Council, also notes additional problems in reorganizing the federal enrichment enterprise. These include vested interests, the general economic distress of the utility industry, antitrust considerations (Mr. Hosmer argues that enrichment is a public utility-like function), and "OMBsmanship" (Mr. Hosmer suggests that OMB uses the enrichment program "to produce fiscal illusions" in the DOE budget and thus is not truly inclined to support either privatization or some kind of hybrid public/private organization). *Id.*

Given the spotty track record of enrichment program management throughout the existing management structure, it certainly seems time for Congress to revisit the question of how the Federal enrichment enterprise might better be organized. The principal limit on the available set of organization structures may arise from the goal that the United States be perceived as a reliable supplier of enrichment services (*see* 22 U.S.C. § 2301(b) (1982)) in order to support U.S. non-proliferation policy. However, one can imagine many structures for the enrichment program compatible with this constraint.

DOE has taken some initial steps in the direction of "privatization." The agency recently advertised in the Federal Register for expressions of interest in aspects of its enrichment enterprise. 51 Fed. Reg. 11811 (1986). DOE received 16 responses (Letter, Mr. Longenecker to Mr. Repici, July 24, 1986), but none amounted to an actual proposal to acquire all or substantially all of DOE's commercial program. The most concrete proposal envisioning a transfer of some of the assets called for a private takeover of portions of the agency's GCEP assets at a fraction of the government costs, with the new GCEP operator contracting to supply enrichment to DOE to furnish to its utility customers. *See INSIDE ENERGY* (McGH) at 69 (June 2, 1986). Such proposals are likely to stir political controversy from several directions. First, some state delegations will be concerned about impact on existing DOE GD plants in their jurisdiction. Second, questions may be raised about the propriety of transferring government assets at a fraction of value to private hands for sale of enrichment services back to the government at a private profit. Third, some doubt has been raised concerning whether enrichment facilities can be sold without congressional approval in the first place. *See* Robert Poling (Cong. Res. Service), Legal Authority to Sell U.S. Uranium Enrichment Facilities without Further Legislation, *reprinted in NUCLEAR FUEL* (McGH) 12-18 (June 2, 1986). DOE deemed the proposal in question inadequate. *See* DOE Press Release (July 19, 1986). Several responses suggested that the agency explore a transition to private ownership through a government corporation. *See* Letter from Mr. Longenecker to Mr. Repici (July 24, 1986) (attachment, Martin Marietta, Goodyear Tire & Rubber, Stone & Webster, Bechtel); *see also Atomic Industrial Forum Comm. on Fuel Cycle Policy, Statement on Privatization of the U.S. Enrichment Business* (Nov. 1986).

