REPORT OF THE FOREIGN RESEARCH REACTOR SPENT FUEL PROJECT

Joseph R. Egan, Esq.
Shaw, Pittman, Potts & Trowbridge

ABSTRACT

The author, a nuclear engineer and partner in the Washington D.C. law firm of Shaw Pittman Potts & Trowbridge, represents Edlow International Company and its group of 15 foreign research reactors in their efforts to foster renewal of the U.S. Department of Energy's (DOE's) longstanding Off-Site Fuels Policy for the receipt of spent weapons-grade research reactor fuel. This paper outlines the genesis of the Policy, its untimely expiration, and the attempts of the foreign reactor community, the U.S. State Department, and other government agencies to prompt DOE to renew it in the face of perceived environmental and legal obstacles.

> This is the story of four people named EVERYBODY, SOMEBODY, ANYBODY, and NOBODY:
>
> There was a critical job to be done, and EVERYBODY was asked to do it. EVERYBODY was sure SOMEBODY would do it. In fact, ANYBODY would have done it, but NOBODY actually did. SOMEBODY got upset because it was really EVERYBODY's job. EVERYBODY thought ANYBODY would do it, but NOBODY realized that EVERYBODY had advice to the contrary from SOMEBODY's lawyer.
>
> In the end, EVERYBODY blamed SOMEBODY when NOBODY did what ANYBODY could have done.
>
> Anonymous
> (Modified by the Author)

INTRODUCTION

Until 1988, DOE and its predecessors had a 35-year policy of receiving, at the Savannah River Site (SRS) or the Idaho National Engineering Laboratory (INEL), shipments of U.S.-origin spent High-Enriched Uranium (HEU) fuel from research reactors abroad. This policy, later named the Off-Site Fuels Policy (the "Policy"), began in 1956 with the execution of so-called "research bilaterals" with countries that desired to share U.S. nuclear technology under President Eisenhower's Atoms for Peace program. The principal purpose of the Policy was to control the spread of nuclear weapons by granting limited access to non-military nuclear technology in return for the recipient's adherence to bilateral agreements for cooperation with the U.S., each of which imposed considerable safeguards on the use of that technology.

Pursuant to the Policy, the U.S. government dispersed weapons-grade HEU of enrichments well into the 90-percent range to dozens of research reactor owners in nearly every country that had executed a bilateral agreement. Prior to 1964, the HEU was simply leased to the recipient. After 1964, foreign recipients were allowed by new legislation to purchase and take title to the fuel. In some cases, these fuel sales were an inducement for larger transactions involving the sale of U.S. research reactor technology and equipment. In all but the very recent cases, it was clearly understood (indeed, demanded by the U.S.) that the HEU fuel, when spent, would be returned to the U.S. for both reprocessing at SRS or INEL and for financial settlement, since even the spent fuel, with enrichments into the 80-percent range, had considerable value as a feedstock for the U.S. weapons program or for recycling back to the research reactor community.

Beginning in 1961, many tons of spent HEU fuel elements were shipped back to the U.S. without incident under the Policy. U.S. port facilities actually competed aggressively for this business. Because the financial terms and conditions governing reprocessing changed over time, the U.S. periodically "renewed" the Policy to reflect these accounting changes by publishing a renewal statement in the Federal Register. None of these notices, which appeared every two to four years until 1987, altered the basic terms of any bilateral agreement, many of which clearly specified that the U.S. "would" receive back the HEU spent fuel.

By the time President Carter came to office in 1977, India had detonated a nuclear device and many in the U.S. government had grown concerned with the widespread dispersal of weapons-grade uranium that had been precipitated by the Policy, notwithstanding the acknowledged benefits that were being provided worldwide by research reactors, including production of medical and pharmaceutical isotopes, materials testing functions, education for commercial engineers, production of materials for instrumentation and tools, and a host of other commercial and research applications.

Accordingly, the U.S. State Department and the U.S. Arms Control and Disarmament Agency (ACDA) were charged with developing significant revisions in non-proliferation laws and policies and with creating appropriate new programs to control the spread of nuclear materials. As an outgrowth of the International Fuel Cycle Evaluation (INFCE) and its U.S. counterpart program, the Non-Proliferation Alternative Systems Assessment Program (NASAP), both conducted in the late 1970s, the U.S. recognized that alternative low-enriched uranium (LEU) fuels could be developed for use in most research reactors without substantially compromising their performance capabilities. This recognition gave birth in 1978 to the Reduced Enrichment for Research and Test Reactors (RERTR) program, which was organized by DOE and administered at various times by DOE and ACDA, with Argonne National Laboratory as the principal contractor.

Under the RERTR program, foreign research reactor owners were strongly encouraged -- through a combination of

diplomatic pressure and exertion of the United States' monopoly control over non-Communist HEU -- to convert their facilities to accommodate LEU fuel developed by Argonne. Over the next decade, most foreign research reactors either made the conversion or developed plans to do so. During this conversion process, the U.S. continued to accept spent fuel from the applicable facilities and, in fact, amended its Policy to include receipt of LEU spent fuel as well as HEU. This amendment was a further inducement for reactor owners to join RERTR. Throughout the conversion process, the U.S. continued routinely to take back foreign spent HEU.

In 1988, however, with only a relatively small amount of research reactor HEU left worldwide (less than 6000 kilograms), DOE's program for receipt of spent HEU abruptly lapsed. This has seriously undermined U.S. non-proliferation efforts and the RERTR program, and has forced many research reactors into an imminent shutdown situation due to lack of storage capacity or alternative disposal options. It has also justifiably angered many foreign governments and reactor owners who incurred considerable expense, at America's behest, to convert their facilities to low-enriched fuel with the understanding that the Policy would continue in force. (In December 1992, the U.S. government's program for the receipt of low-enriched spent fuel from these reactors also lapsed without notice.)

Expiration of the Policy

In 1987, the periodic Federal Register notice that had been so perfunctory was this time not so routine. For one thing, it specified a renewal period of only one year. Additionally, it stated that DOE was evaluating an unprecedented 10-year renewal of the policy, but would need to perform an Environmental Assessment (EA) of the proposed renewal pursuant to the National Environmental Policy Act (NEPA). (NEPA, incidentally, was enacted in 1970, and had never previously forestalled DOE from importing spent research reactor fuel.) Informally, DOE notified several concerned research reactor owners that the EA would be completed in a matter of some 6 months.

By January 1, 1988, however, the renewal period had expired with no announcement or notification from DOE to the reactor community, with no EA issued, and with no opportunity for interested parties to comment. SRS and INEL were notified to stop accepting shipments from abroad, and the Policy came to an immediate standstill. Meanwhile, DOE continued to allow receipt (and does so to this day) of spent fuel at Savannah River from U.S. university research reactors on the legally questionable theory that, since this fuel is owned by DOE (unlike the foreign fuel), the NEPA obligations are somehow different.

It was precisely at this time that DOE was embroiled in litigation brought by Sierra Club challenging DOE's importation of research reactor spent fuel from Taiwan that, in fact, was not U.S.-origin but Canadian-origin fuel. Sierra Club maintained that DOE had not satisfied NEPA when it decided to import the fuel. NEPA, it was alleged, required DOE to conduct a full Environmental Impact Statement (EIS) of the hazards associated with shipping, with temporary storage at U.S. port facilities, and with storage and/or reprocessing at SRS. DOE maintained that only a more limited and less time-consuming EA was required.

The federal District Court for the District of Columbia ruled that an EIS was not required, but that DOE's EA was nevertheless deficient for a variety of reasons listed by the court. Accordingly, the court enjoined any further shipment of the Taiwanese fuel. In fact, only one small shipment remained. Rather than complete the EA as instructed by the court or appeal the decision, DOE simply abandoned this last shipment, which finally was unloaded and returned to storage in Taiwan in 1992.

In the context of this litigation, Steven Wakefield, then DOE's General Counsel, made a written commitment to Sierra Club that DOE would not import spent fuel from other foreign countries until the "NEPA process" had been completed on the Off-Site Fuels Policy as well. That meant, at a minimum, completion of an acceptable EA on the proposed renewal.

After strong expressions of concern from abroad, DOE implored reactor owners informally to be patient for a few more months, for it was only the completion of new environmental requirements, DOE contended, that impeded immediate renewal. In fact, Secretary Watkins wrote to the Commissioner of the European Communities in September 1990 that, assuming "satisfactory resolution" of public comments received on its proposed EA, "the Department of Energy expects to publish a new policy and then be in a position to resume acceptance of irradiated research reactor fuels as soon as possible thereafter." In reliance on DOE's commitment, several of the reactor owners postponed their plans to develop alternative arrangements with European reprocessors.

The Original EA

Fully three and a half years elapsed before DOE finally released, in May 1991, its 27-page EA on renewal of the Policy. The EA, written largely by Sandia National Laboratory, was accompanied by a proposed Finding of No Significant Impact (FONSI) that was published in the Federal Register that same month. Although not required by NEPA, public comments on the EA and proposed FONSI were invited by DOE.

Unfortunately, the EA lacked the level of analysis required for it to gain the support of those who had opposed the Taiwanese fuel shipments. In fact, the EA failed to address several of the key issues identified by the court in the earlier Sierra Club litigation as necessary to prevent injunctive prohibitions on shipment. All told, over 75 public comments were received by DOE, the overwhelming majority negative.

Many of the commenters expressed surprise and outrage that the issues brought to light in the Sierra Club case were not addressed in the analysis of DOE's substantially broader program to import spent HEU from numerous countries. Reactor owners, too, were discouraged to find that DOE had virtually ignored the non-proliferation objectives of the program, the diplomatic repercussions of non-renewal, the reliability of the U.S. as a nuclear trading partner, safety and legal implications, and other technical and policy arguments that augured strongly in favor of renewal. The fact that non-renewal could and probably would undermine a longstanding and expensive federal initiative to convert research reactors to LEU was never mentioned in the EA.

The storage-only renewal option (i.e., renewal without reprocessing) was dismissed without explanation in the EA as simply "unacceptable." Meanwhile, the "no-action alternative," i.e., the continued reluctance of DOE to address or renew the program, was found without explanation to be "inconsistent with the policy objectives and concerns of the

Atomic Energy Act of 1954, as amended, and the Nuclear Nonproliferation Act." That left renewal with reprocessing as the only alternative found viable by DOE under its NEPA analysis. Review of the public comments on the EA reveals that DOE's decision to reprocess the Policy fuel served as the catalyst for opposition to the renewal on proliferation grounds -- the very grounds that logically should have served to bolster the prospects for renewal.

DOE Ceases Reprocessing

As fate would have it, DOE's decision in April 1992 to phase out all reprocessing activities as part of the end of the Cold War removed this lone alternative from the environmental balance sheet, and DOE was suddenly stuck with an EA and proposed FONSI that recommended what it now proscribed itself, while simultaneously declaring the two most credible NEPA alternatives -- storage only, and nonrenewal -- infeasible.

DOE's cessation of reprocessing came several months after then-Secretary Watkins had both ordered an internal interdisciplinary review of the renewal project and solicited the views of other U.S. government agencies. In response to his inquiries, ACDA, the Nuclear Regulatory Commission, and the State Department all strongly urged that the policy should be renewed.

The interdisciplinary review requested from within DOE, however, was never in fact completed. Instead, custody over the Policy was transferred from Defense Programs to International Affairs, then from International Affairs to the newly created office of Domestic and International Energy Policy, then briefly to the office of Arms Control and Nonproliferation, and finally to the new Deputy Secretary of Energy, who had yet to be confirmed. During the 18 months following receipt by DOE of public comments on the EA, not a single modification had been undertaken. In the interim, moreover, the very premise of the original EA -- reprocessing -- was removed by Secretary Watkins from the policymaking calculus.

Reactor Owners Seek Alternatives

Needless to say, by mid-1992 many of the foreign participants in the Policy had begun to experience serious operational and diplomatic problems as a result of DOE's inaction. Since none of the reactors were designed and sold with storage pools, many faced imminent shutdown. In Germany, for example, license conditions would soon mandate a shutdown. Aluminum-clad fuel belonging to some facilities was beginning to corrode. To make matters worse, the U.S. government's monopoly over new HEU had begun to erode as a result of the apparent sudden availability of significant quantities of ex-Soviet HEU in the world marketplace. Thus, many of the reactor owners began to question the benefits, if any, associated with the RERTR program. Some threatened to withdraw from RERTR. Others threatened to re-convert to HEU. While this debate raged, neither DOE, ACDA, Argonne, nor the State Department was involved.

The reactor owners, believing earnestly that "delay" had itself become the policy at DOE, began to explore alternative means of coping with their spent fuel. At the time when the Bush Administration was ceasing reprocessing and pressuring other nations to do the same, AEA Technology in the U.K and Cogema in France each began to offer reprocessing alternatives to research reactors at a proposed cost several times that which had been applicable in the U.S. In either case, however, reprocessing would be undertaken only if the participating reactor owners agreed to accept return of all associated high-level nuclear waste from reprocessing within 25 years, at the outside. For countries like Austria (which hosts the reactor used by the International Atomic Energy Agency) and Australia, which have no nuclear power program and no nuclear waste program, such "alternatives" were in fact untenable from inception. For other nations, however, they were very seriously weighed.

Because Cogema later declined to continue seriously to offer reprocessing services for research reactors, AEA became the only remotely palatable option available to some reactor owners. AEA, however, stated in June 1992 that because of its well-known financial problems, it would either cease operating altogether or would engage in a limited campaign to reprocess research reactor fuel; thus, it imposed a November 1992 deadline, by which time it needed commitments from the reactor community. The reactor owners were therefore faced with a paradox: Either sign with AEA (in which case they would be forced to receive back their high-level waste) or wait for DOE to make a decision. But if they waited for DOE, they risked losing altogether the AEA option, since AEA's reprocessing services might soon cease to exist.

Formation of the Edlow Group

Cognizant of this crisis, Edlow International Company (the world's largest nuclear fuel shipper) and Shaw Pittman formed the Foreign Research Reactor Spent Fuel Project (the "Edlow group") in June 1992 for the purpose of representing the interests of the research reactor community in their efforts to foster, at a minimum, a decision from DOE as to the future direction, if any, of the Policy. Initially, the Edlow group consisted of six reactor owners from four countries. Today, the group has grown to over 15 reactor owners from Europe, Australia, and the Pacific Rim, with the Euratom Supply Agency participating in an observing capacity.

The Edlow group first conducted a comprehensive legal and policy analysis showing that DOE's actions and inactions constituted possible violations of the Administrative Procedure Act, were wholly inconsistent with U.S. and international non-proliferation programs and policies, and amounted to a possible breach of contract on several fronts. The Edlow group then entered into discussions with senior executives of DOE, the State Department, ACDA, the National Security Council, the NRC, Congressional representatives, and the non-proliferation community (including groups such as the Natural Resources Defense Council, the Nuclear Control Institute, and the Carnegie Endowment for International Peace). Remarkably, these discussions produced a virtual consensus among all of the various groups (except DOE) that the Policy should expeditiously be renewed. These various groups each made communications to DOE to that effect.

DOE, meanwhile, continued to receive advice from its Office of General Counsel that environmental constraints prohibited timely renewal. In the face of this advice, the agency remained silent to foreign inquiries, despite visits by ambassadors and what one DOE staffer characterized as a "blizzard of paper" from overseas governments. DOE's attorneys apparently feared, notwithstanding the court's decision in the Sierra Club case, that renewal of the Policy could not be accomplished without conducting a full EIS. Moreover,

they expressed concern with the cost of a storage-only option, and with the practicalities of long-term storage at federal facilities.

In response to those concerns, the Edlow group wrote to the acting General Counsel that reactor owners (a) were willing to pay their pro-rata share of the actual costs to the U.S. of long-term storage and disposal; (b) were willing to work with DOE and environmental groups to ensure that concerns expressed in response to the original EA were adequately addressed in a modified EA; (c) were willing to share a comprehensive legal analysis showing that an EIS appeared not to be required for renewal; and (d) were willing to follow through with Congressional staffers and non-proliferation groups who had indicated that non-proliferation-based legislation could potentially be procured, if necessary, to address any bona fide NEPA problems.

The 1992 RERTR Conference

It was only when the overwhelming majority of the hundred-plus delegates to the RERTR program in Roskilde, Denmark voted in September 1992 to rethink their participation in RERTR that the crisis finally came to a head. Ironically, DOE was at this very time planning to develop a Russian parallel to RERTR, seemingly unaware of the problems being experienced with its own program. On the closing day of the Roskilde conference, an extraordinary letter was approved by majority vote and faxed to Secretary Watkins, which stated in part:

> It is the opinion of the majority of the [RERTR] attendees ... that the non-renewal of the Off-Site Fuels Policy jeopardizes the non-proliferation achievements up to now and removes the incentive for a continued support to U.S. non-proliferation efforts.

This letter was followed in October 1992 by a strongly-worded letter to Secretary Watkins from Secretary of State Lawrence Eagleburger urging prompt renewal of the Policy and expressing fear that continued DOE inaction was leading to a forfeiture of longstanding non-proliferation gains.

DOE Makes a Decision

On December 23, 1992, Secretary Watkins issued a decision letter to Secretary Eagleburger stating officially that DOE intended to renew the Policy, subject to completion of the NEPA process. Although this letter estimated that NEPA review could involve another 2 to 3 years of delay, a subsequent DOE letter to the Director of ACDA specified a more optimistic 6 to 8-month time frame.

On the parting instructions of Secretary Watkins and DOE's three-month Deputy Secretary Hugo Pomrehn, custody over the Policy was assumed on January 15, 1993 by a capable new joint team of career officials from the Office of Arms Control and Nonproliferation ("AN") and the Office of Environmental Restoration and Waste Management ("EM"). This new team immediately dispatched a representative to Brussels to meet with the Edlow Group and the Euratom Supply Agency and has promised to issue a communication *directly to reactor owners* worldwide.

New Action Plan

Already, a new action plan solidly based on established non-proliferation policy has been developed by this team. An initial demonstration period would seek to retrieve from lesser-developed countries the limited amount of HEU still residing there. Simultaneously, the needs of developed nuclear trading countries would be prioritized and those shipments necessary to forestall immediate operational and safety crises would be undertaken as soon as possible.

Following the initial demonstration period, the U.S. would continue to receive all U.S.-origin spent HEU fuel until it had been returned in its entirety, and would also accept U.S.-origin LEU fuel from RERTR participants which had or were undergoing conversion, but only for that period of time necessary to ensure that proliferation risks from U.S. origin HEU had been eliminated. Foreign reactors other than those in lesser-developed countries would pay the actual pro-rata costs of long-term storage and ultimate disposal. Pursuant to legislation passed in 1992, no more HEU fuel would be sold to research reactors by DOE.

In short, the proposed new Policy has both a widely accepted and a proven rationale, both a clear beginning and a clear end, and is effectively without cost to the U.S.

The Challenge to the Clinton DOE

Whether the implementation of Policy renewal proves workable now or is rendered illusory by additional years of self-imposed bureaucratic obstacles is today a fundamental challenge of the Clinton DOE.

DOE's Office of General Counsel continues to assert the desirability of a full-scope EIS. While reactor owners, federal policy analysts and non-proliferators do not quibble with the need for a modified environmental review, they believe an EA is more than sufficient to address the environmental issues associated with renewal of this 35-year Policy. It is the carefully researched opinion of the Edlow group (supported by many in Congress and in other agencies of the government) that a properly conducted EA -- one sympathetic to the comments from opponents of the original EA as well as the reactor owners themselves -- will be both legally and, on the merits, substantively sufficient to support prompt renewal of the Policy.

To be sure, the merits of an environmental assessment cannot, should not, and will not be prejudged. That is a risk, however, that reactor owners and their shippers are more than willing to take.

The practical and well-tested aspects of shipping, the proven routes to federal facilities, the truly small amounts of material to be shipped and stored, and the vast quantities of HEU spent fuel that DOE must deal with anyway for its naval propulsion program, its 34 university research reactors, and a myriad of other federal applications (to say nothing of the several hundred metric tons of ex-Soviet HEU being discussed in the context of nuclear weapons dismantlement), appear to reactor owners to make any putative environmental hazards associated with Policy renewal pale against the obvious proliferation and diplomatic hazards of non-renewal.