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The NRC and The DOE:
An Evolving Regulatory Relationship

by

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Introduction

Good morning, ladies and gentlemen. I would like to thank you for giving me this opportunity to discuss, in a broad sense, the evolving status of the relationships between the Nuclear Regulatory Commission (NRC) and the Department of Energy (DOE). Over the past several years, the NRC and the DOE have interacted in a number of well-defined areas—some based on statute, such as high level waste (HLW) disposal, and some based on interagency arrangements, such as the NRC review of new Naval Reactor designs. More recently, the NRC has had an expansion of interactions with the DOE on a variety of fronts: with regard to licensing, standard-setting responsibilities, and regulatory oversight of DOE nuclear facilities. This partly has been driven by appropriations and authorization language. For example, since 1998, the Energy and Water Appropriations Bills have included conference report language that, with the exception of certain national security needs, “All new [DOE] facilities for which construction starts in the year 2000 and beyond...are to be constructed in accordance with Nuclear Regulatory Commission licensing standards.” Just this year, statutory language in the Defense Authorization Bill made specific provisions, which I will discuss shortly in more detail, for the NRC licensing of a Mixed Oxide (MOX) Fuel Facility.

In addition to those activities already mentioned, the NRC and the DOE have existing regulatory relationships with respect to the Gaseous Diffusion Plants of the United States Enrichment Corporation, the remediation of Uranium Mill Tailings sites, the Independent Spent Fuel Storage Facility at Fort St. Vrain, the review of DOE transportation packages, the West Valley Demonstration Project, the review and certification of the transportation packages for the Waste Isolation Pilot Project, the developing work on the stabilization of the Hanford Tank Wastes, classification of Tank Wastes at the Savannah River site, and the possible licensing of tritium

production in a commercial reactor. Finally, in a more broad-scope effort that began in 1997, the NRC and the DOE have embarked on a pilot program to explore options (relating to a comprehensive framework) that may support legislation for the external regulation of certain DOE nuclear facilities.

As you can see, this range of activities constitutes an evolving NRC/DOE relationship with multiple facets. Today, I would like to discuss briefly the actions of both agencies in four of these areas: (1) Hanford Tank Waste Remediation System; (2) U.S. Enrichment Corporation; (3) Surplus Weapons-Usable Plutonium Disposition; and (4) DOE External Regulation Pilot Program.

Hanford Tank Waste Remediation System

As many of you know, the DOE has been working for some time on the Hanford Tank Waste Remediation System (TWRS) project on the Hanford Reservation in Richland, Washington. This facility includes 177 storage tanks, some single-shelled, some double-shelled, all containing high-level radioactive waste, some of which is not well characterized. Some of the tanks have leaked, and others are vulnerable to leakage. Past events have revealed the vulnerability of this overall system in terms of the potential safety and environmental hazards.

The TWRS project represents a major privatized clean-up effort by the DOE to address the legacy of these tanks. The goal of the TWRS privatization strategy was to make greater use of the technologies, demonstrated efficiencies, and management discipline of private industry to provide effective solutions to the tank waste challenge. The project, as originally conceived, was to proceed in two phases: Phase 1 characterized as a demonstration phase, in which the DOE would provide regulatory oversight to a privatization contractor, and the NRC would work with the contractor to position for potential regulatory oversight in the second phase; and Phase 2, the production phase, in which the privatization contractor is proposed to be licensed by the NRC. This would be in keeping with the provision from the 1998 Energy and Water Appropriations Act, calling for future DOE nuclear facilities to be built to NRC standards.

An NRC/DOE MOU was executed on January 29, 1997, specifically for the demonstration phase (Phase 1) of this project. This MOU calls for the NRC to provide technical assistance and support to the DOE in the development of a comprehensive regulatory program, consistent with the NRC regulatory approach, for processing and solidifying Hanford tank wastes into forms suitable for final disposal, while protecting the general public, workers, and the environment. This support has been provided by the NRC. On August 24, 1998, the DOE signed a contract with British Nuclear Fuels, Limited (BNFL) that authorizes BNFL to proceed with developing a preliminary design for a facility that would operate as a full-production plant for several years, thus eliminating the demonstration portion of the project (Phase 1). The Congress in FY 1999 continues to appropriate funding for NRC participation in this project.

The DOE currently is responsible for regulating the activities of the privatization contractor, the ultimate goal of NRC participation is to provide a smooth transition to NRC regulation at the appropriate point. Legislation will be necessary to clarify and authorize the NRC regulation of these activities. Given the recent changes in the DOE approach to privatization, this may be an appropriate time to address when NRC regulatory oversight would be appropriate, and what legislative changes would facilitate a transition to NRC regulatory authority early in the design and approval stages for the new facility.

USEC: Gaseous Diffusion Plants, Privatization, and AVLIS

The Energy Policy Act of 1992 created the United States Enrichment Corporation (USEC) and directed the DOE to lease to the USEC the two gaseous diffusion plants (GDPs) located in Portsmouth, Ohio, and Paducah, Kentucky. The Act further provided that the NRC would regulate nuclear safety and safeguards at the GDPs and that the NRC would establish a certification process to ensure that the USEC complied with applicable NRC regulations. In February 1994, the NRC issued a proposed new rule (10 CFR Part 76) to govern the certification of the GDPs, and in September 1994 the rule was finalized. The certification process was designed to provide a flexible method for bringing under NRC jurisdiction pre-existing DOE facilities, to identify safety issues that must be addressed before certification, and to delineate those issues that would be addressed during the post-certification compliance phase. In mid-FY 1995, the USEC submitted its initial application for certification, beginning an iterative cycle of NRC review and USEC revision. In November 1996, the NRC issued certificates of compliance that became effective in March 1997. The interim period, from November 1996 to March 1997, allowed the USEC to make an orderly transition from DOE to NRC requirements. In 1997 the Commission, as part of a Congressionally mandated change, revised its requirements under Part 76 to allow the GDPs to recertify on a five year basis rather than the previous requirement of annual recertification.

The NRC experience with the GDPs provides a good model for the NRC approach to regulating existing DOE facilities, incorporating lessons learned. The NRC evaluated the requirements necessary to regulate the facilities and, where appropriate, revised its regulatory framework to ensure adequate protection of public health and safety, without placing unnecessary requirements on the facilities.

The USEC Privatization Act of 1996 laid out the process for privatizing the USEC. The Act required the corporation, in consultation with the NRC, and other relevant Federal Agencies, to make determinations in the following four areas: (1) that privatization will result in a return to the United States Government at least equal to the net present value of the corporation; (2) that privatization will not result in the corporation being owned, controlled, or dominated by an alien foreign corporation or foreign government; (3) that privatization will not be inimical to the health and safety of the public or the common defense and security; and (4) that privatization will provide reasonable assurances that adequate enrichment capacity will remain available to meet the domestic electric utility industry (needs). Therefore, to support the smooth transition of the GDPs to privatization, the NRC prepared a Standard Review Plan (SRP) that addressed the two options for USEC privatization under the Act—an initial public offering and a private merger/acquisition. The NRC interacted extensively with multiple government agencies—in particular, the Department of the Treasury and the National Security Council—during the development of its USEC SRP. The NRC also engaged the services of an investment banking firm to ensure that the resultant SRP not only met statutory requirements, but also was consistent with what a privatization financial transaction requires. The NRC development of the SRP was praised by the parties involved for facilitating relevant aspects of the privatization process. The resulting transition of the USEC to a privately held corporation was completed this past summer.

Additionally, under privatization, the USEC has exclusive commercial rights to deploy and use atomic vapor laser isotope separation technology (AVLIS) patents, processes, and technical information owned or controlled by the Government. The USEC is planning to submit a license application to the NRC to construct and operate an Atomic Vapor Laser Isotope Separation

(AVLIS) facility that uses laser technology to enrich natural uranium. Some submittals that are not site-specific, such as the quality assurance plan, the classified matter protection plan, and the nuclear criticality safety validation report, have been submitted for staff review before the license application is submitted; other submittals for staff review also are expected before receipt of the license application. The staff plans to use 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," to license AVLIS. The USEC last week launched a site selection process to evaluate possible sites for the facility. The USEC plans call for the plant to be completed and licensed by the NRC in 2005. The NRC staff has continued to interact with the appropriate personnel within the USEC as the Corporation addresses the use of this technology to ensure our readiness to deal with any unique health and safety or safeguards concerns associated with this new technology.

I would note, finally, that the Commission frequently is asked why it "took so long and cost so much" for the NRC to certify the safety of the GDPs and for these DOE facilities to come under NRC jurisdiction? The short answer relates to two key factors that contributed most to the length of the certification process: first, at the time this process began, the facilities did not meet the then-existing DOE requirements; and second, the original USEC application for NRC certification did not contain adequate information (based on Part 76) to provide a basis for NRC review. The time required to complete actions on any license (or, in this case, certification) application is dependent on the quality of the application, the responsiveness of the applicant to requests for additional information, the complexity of the issues involved, and the availability of NRC resources. In the case of the GDPs, the factor contributing the least to the time it took to complete certification was the availability of NRC resources. We believe that the primary contributor was the effort it took to bring the facilities into compliance with DOE requirements. Early DOE estimates had placed the NRC certification costs at about \$40 million, with about \$160 million required to bring the plants into compliance with existing DOE requirements. The NRC recently has received revised DOE summary estimates, which conclude that the total DOE/USEC costs associated with the transition to NRC regulation was approximately \$301 million. About half of this amount was for the plant and procedure upgrades that were required to bring the plants into compliance with DOE requirements.

Surplus Weapons-Usable Plutonium Disposition Activities in the United States

At a recent Summit in Moscow, U.S. President Clinton and Russian President Yeltsin signed a Statement of Principles for long-term cooperation to dispose of our excess weapons-usable plutonium with appropriate transparency and international monitoring. Effectively implementing a program for the dispositioning of excess weapons-usable plutonium is an urgent security priority. Such a program cannot only help to pave the way for steeper reductions in nuclear arms, but it also can reduce the risks that these dangerous materials may be acquired by terrorists.

The DOE is the lead agency for surplus plutonium disposition in the United States. The DOE issued its Record of Decision for the storage and disposition of Weapons-Usable Fissile Material on January 14, 1997. In it, the DOE proposes to implement a hybrid approach:

- (1) The first strategy would be the fabrication of mixed plutonium oxide/uranium oxide (MOX) fuel elements, which would be irradiated in NRC-licensed commercial power reactors. The irradiated fuel would be disposed of at the geologic repository for high-level waste that the DOE plans to construct and operate. Approximately two-thirds of the surplus plutonium would be treated in this way.

- (2) The remaining one-third of the surplus plutonium would not be used in MOX fuel and, instead, would be immobilized in a vitreous form suitable for disposal at the geologic repository.

The DOE proposed that the NRC would be responsible for licensing, from both the safety and the safeguards perspectives, the operation of the facility. Decisions regarding the extent of the NRC involvement in pit disassembly, conversion, and immobilization have not, as yet, been made. At a minimum, the NRC will provide the DOE with standards that would be utilized in the event these activities were to be licensed. The DOE plans to locate the MOX fabrication facility at a Government-owned reservation, possibly the Savannah River Site. Following completion of the fabrication activities, the facility will be returned to DOE control. Any use of MOX fuel in a commercial nuclear reactor would require NRC licensing under existing statutes.

Under 42 US Code 7272, the NRC is prohibited from using its appropriated funds for any purpose related to the licensing of any defense activity or facility of the DOE. Therefore, the NRC long has expressed the view that statutory authority to clarify the NRC licensing role was a necessity in a project with the national security and energy security implications of this program. The 1999 Defense Authorization bill provides that any facility under contract with and for the account of the DOE which fabricates mixed plutonium–uranium oxide nuclear fuel for use in a commercial reactor shall be licensed by the NRC. The bill specifically states that the prohibitions on the expenditure of funds under 42 USC 7272 shall not apply to this licensing activity. As yet, there has been no Congressional Action specifically regarding the NRC role in licensing an immobilization facility; however, it is important to note, once again, the language from the Conference Report of the 1998 Energy and Water Appropriations Act, (repeated for FY 1999), calling for future DOE facilities to be built to NRC standards.

The NRC and the DOE signed a reimbursable agreement in July 1997 under which the Commission provides support prior to receipt of a license application. Currently, there are four open tasks under this agreement:

- Task 98-1, Support for MOX fuel request for proposals (RFP): (The RFP was issued May 19, 1998, and proposals were due by September 4, 1998.) This task was established to enable the NRC to support the DOE in responding to questions regarding the RFP. There were proposals from three consortia:
 - Duke Engineering and Services, COGEMA, Inc, and Stone and Webster
 - BNFL, Inc., Babcock & Wilcox, Bechtel Group, and PECO Energy Co.
 - Siemens Power Corp., Raytheon Co., Battelle, Mason & Hanger, Washington Public Power Supply, and PECO Energy Co.

The DOE currently has the proposals under review and has not yet asked the NRC to respond to any questions. The DOE plans to award the contract about November 30.

- Task 98-2, Development of a standard review plan (SRP) for a MOX fuel fabrication facility license application: The NRC has developed and provided the DOE with an outline of the draft SRP. Modules for the SRP are scheduled to be provided in draft to the DOE in June 1999, with a final SRP scheduled to be released in the Year 2000.

- Task 98-3, Identification of NRC standards applicable to the design of a pit disassembly and conversion facility: The NRC has received a conceptual design report for the facility and currently has the report under review to complete the task.
- Task 98-4, Identification of NRC standards applicable to the design of an immobilization facility: The NRC has not yet received the conceptual design report; however, it stands ready to begin the task upon receipt of the report.

The NRC has received the DOE draft Environmental Impact Statement (EIS) on site surveys for surplus plutonium disposition covering the MOX fuel facility, pit disassembly and conversion, and immobilization. Information in the EIS will be utilized in the MOX licensing process and in support of other activities related to external regulation of the DOE.

DOE External Regulation Pilot Program

In 1994, legislation was introduced in the House of Representatives which would have subjected nuclear safety of new DOE facilities to immediate external regulation, and which would have created a stakeholder group to study the external regulation of existing facilities. As an alternative to that approach, Hazel O'Leary, the Secretary of Energy at that time, created in January 1995 the Advisory Committee on External Regulation of DOE Nuclear Safety, which recommended that essentially all aspects of safety at DOE nuclear facilities be regulated externally. Secretary O'Leary then created the DOE Working Group on External Regulation to provide recommendations on report implementation. The primary recommendations of the Working Group were (1) that the NRC should be the external nuclear safety regulator, and (2) that the transition to external regulation should be phased in over time. Shortly thereafter, Secretary O'Leary announced that the Administration would introduce legislation in FY 1999 to give the NRC responsibility for regulating nuclear safety at certain DOE nuclear facilities. Such oversight of DOE nuclear safety was not sought by the NRC, but, after considering the DOE announcement, as well as the strong public support for this NRC oversight expressed during the comment period for our strategic assessment and rebaselining, the Commission altered its earlier position of neutrality on this issue, and endorsed the NRC oversight of DOE nuclear facilities, including nuclear safety and radiation protection. This was, however, a cautious endorsement. In its decision, the Commission delineated a significant number of issues requiring resolution, and subjected its endorsement to several caveats regarding the need for adequate funding, sufficient staff resources, and clear statutory delineation of NRC authority.

Both the Advisory Committee and the Working Group concluded that the transition to NRC regulation would involve significant legal, financial, technical, and administrative adjustments for both agencies. Given the wide variability in facility types and hazards, the Working Group recognized that the "one-size-fits-all" approach to regulation would not work, and did not attempt to outline fully the structure or method of external regulation. Thus, in early 1997, many substantial gaps remained in the information and analyses on how external regulation should be implemented. Partly due to these reasons, acting on behalf of the Commission, I began to work with Secretary O'Leary, and shortly thereafter with DOE Secretary Federico Peña, on an approach that would explore external regulation options through the use of a pilot program.

The pilot program was established through a November 21, 1997 NRC/DOE Memorandum of Understanding (MOU), signed by Secretary Peña and myself, designed to provide a comprehensive framework to support legislation for the external regulation of certain DOE nuclear facilities or classes of facilities.

The objectives of the MOU are being addressed by conducting a series of pilot projects at sites throughout the DOE complex. Although the DOE Working Group on External Regulation recommended, under its Option 2, that DOE defense program facilities should come under NRC regulation after 10 years, the current pilot program has focused on non-defense program facilities, and the NRC currently has no plans to conduct pilot programs to examine external regulation of DOE defense program facilities. In the House Report appropriating \$1 million for the pilot program in FY1998, Congress stated that: "this demonstration effort should not interfere with ongoing national security programs, nor with current regulatory and other oversight authorities for nuclear safety at Department facilities." We have interpreted this to mean that, among other things, DOE defense program facilities are not to be included in the pilot program.

The pilot program is testing regulatory concepts at agreed-upon sites, through a process that has been termed "simulated regulation." Specific implementation details for each pilot facility have been negotiated by the DOE, the NRC, and DOE contractors, in individual work plans for each pilot facility. However, each plan also contains a consistent set of core questions and issues that need to be addressed for all facilities. Examples include: (1) For each facility or class of facility, what is the value added of NRC regulatory oversight? (2) What would the costs be (both to the DOE and to the NRC) related to NRC regulation of this facility or this class of facility? (3) What would be the optimal regulatory arrangement and process for this facility or class of facility? (4) Should the process be one of certification or licensing? (5) Who should be the licensee or the certificate holder—the DOE or the DOE contractor? and (6) What legislative changes would be necessary to establish this optimal regulatory authority?

Status of Current Pilots

Lawrence Berkeley National Laboratory

The pilot program began in FY 1997, the site work was completed in January 1998. The LBNL site work tested the work plan for a broad-scope license approach at a complex DOE laboratory. A "mock license" was developed which was typical of that of an NRC-licensed major research and development center such as the National Institutes of Health (NIH) or the University of Missouri—which, in NRC terminology, would be a broad-scope licensee under 10 CFR Part 33. No significant safety issues were identified at LBNL.

Radiochemical Engineering Development Center at Oak Ridge National Laboratory

The pilot program at the Radiochemical Engineering Development Center (REDC) of the Oak Ridge National Laboratory (ORNL) presented an opportunity for the NRC to gain experience with hot cells for processing, storing, and packaging very heavy elements that are somewhat rare in the research community. The field work was completed in June 1998. The tentative conclusions of the work to date are that REDC (as well as ORNL) is licensable without significant changes to the facilities or to their radiation safety programs.

Receiving Basin for Offsite Fuel at the Savannah River Site

The third pilot for FY 1998 is underway at the Savannah River Site Receiving

Basin for Offsite Fuels (RBOF), and is scheduled for completion in late 1998. This pilot project will give both the NRC and the DOE experience in determining the extent to which NRC regulation can be applied to a facility designed and constructed almost thirty years ago. At RBOF, NRC staff found that the DOE and its contractor, Westinghouse, were controlling risks to acceptable levels. For the record in this case, I also should note that the NRC previously regulated the fabrication, use, storage and shipment of nearly all the high-enriched, non-power reactor fuel currently stored at RBOF (also referred to as strategic special nuclear material, or SSNM). To date, brief staff reviews at RBOF have focused on dominant safety, safeguards, and security risks, engineered and human controls to make risks acceptable, and the availability and reliability of risk controls. RBOF pilot work to date indicates that, except for some safeguards issues that we still are examining, the facility, as it currently exists, is amenable to NRC regulation.

All three pilots have given us an opportunity to develop work plans for simulated regulation of the facilities, to understand better the ramifications and implementation issues associated with regulating DOE facilities, and to work closely and collegially with the DOE and its contractors.

Status of Future Pilots

The anticipated FY1999 pilot projects will involve more challenging and complex facilities, to broaden the overall understanding of the complexities and ramifications of external regulation of DOE nuclear facilities. The next pilot project will take place at Pacific Northwest National Laboratory (PNNL) beginning in the fall of this year and will include local authorities as decided by the State of Washington, and OSHA. The activities at PNNL entail more than the byproduct-material activities at LBNL, and more than the fabrication and processing of reactor targets at REDC; therefore, this project will broaden our understanding of the ramifications of NRC regulation at DOE national laboratories. In addition, the DOE likely will propose a non-power reactor and an Environmental Management facility as the final two pilot projects for 1999. I believe that this set of six pilot projects, taken together, will provide adequate experience in examining the full range of implementation issues associated with NRC regulation of the nuclear safety of non-defense program facilities of the DOE, and will support a broad decision on the desirability of extending NRC jurisdiction to the regulation of DOE non-defense program activities.

Congressional Interest in DOE External Regulation Pilot Program

The Congress has shown consistent and substantial interest in the issue of external regulation of DOE nuclear facilities as a means of establishing a unified safety standard for those facilities. For FY 1998, the Congress appropriated \$1 million to the NRC for conducting the pilot program of "simulated regulation." A similar amount has been authorized for FY 1999. On October 7, 1998, the President signed the Congressional Energy and Water Appropriations legislation. The Appropriations Conference report language stated that the DOE, within the pilot projects, should address the interactions of all safety regulators, including not only the NRC but also the Occupational Safety and Health Administration (OSHA), as well as State and local regulators of worker health and safety.

Recent questions have been raised about the DOE commitment to the program. From appropriations Committee language, it is clear that the Congressional intent is for the pilots to continue and then make a national policy decision, involving DOE, the Congress, the NRC, and other stakeholders, regarding the best means to provide nuclear safety and environmental oversight of the DOE nuclear facilities. Funds have been provided for the FY 1999 pilots; therefore, the NRC will participate in good faith and finish what it has been asked to do; and will attempt to address Congressional questions and concerns, working with the DOE, OSHA, the States, and local entities in the expanded pilot programs at LBNL and the future pilots. However, the NRC will not take the lead role in any organizational sense and will be careful and deliberate in its approach, until there is more clarity of commitment to this program from the DOE and the Congress. Our own staff has been asked to develop a series of independent position papers, for Commission consideration, on the issues identified to date through the pilot programs.

Conclusion

I would like to thank you for asking me to speak to you today, and I hope that I have provided some insights to the general NRC approach to regulation of DOE nuclear facilities. The NRC provides regulatory oversight across a broad spectrum of licensees and licensed activities; therefore, there is no one-size-fits-all approach to NRC regulatory activities. Moreover, the NRC move toward risk-informed, performance-based regulation inherently provides that the degree and structure of NRC oversight is tailored to match the risks involved. As the NRC and the DOE continue the existing pilot program, we must be cautious and deliberate both in completing the pilot studies and in analyzing the results to determine the overall feasibility of the NRC providing nuclear safety and safeguards regulatory oversight for classes of DOE facilities. Given the lessons that we have learned as an agency through our experience in certifying the USEC GDPs and other similar efforts, we believe that this cautious, yet flexible NRC approach, together with the appropriate legislative authority and funding, has been and will continue to be sufficient to address the full spectrum of logistical, procedural, and legislative issues associated with the NRC regulation of designated DOE activities.

Thank you.