

**LESSONS LEARNED FOR DOE  
CONTRACTORS FACING  
INDEPENDENT NUCLEAR REGULATION**

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**ABSTRACT**

Contractors at U.S. Department of Energy (DOE) nuclear facilities that have grown accustomed to the traditional DOE oversight mechanisms and DOE Order system will face new challenges when they are confronted with the newly emerging forms of independent nuclear safety regulation at DOE facilities. “Independent” regulation of nuclear safety at DOE facilities includes not only potential “external regulation” by the Nuclear Regulatory Commission (NRC), but also DOE’s own efforts to create regulatory oversight and enforcement regimes that are separate and independent from the traditional contract-based oversight mechanisms.

There are some significant early experiences with independent regulation of DOE facilities that have produced important “lessons learned” for DOE contractors. These experiences include: (1) the NRC’s certification of the uranium enrichment gaseous diffusion plants; (2) the NRC/DOE Pilot Program on External Regulation; and (3) the independent DOE Regulatory Unit’s regulation of the Hanford Tank Waste Remediation System Privatization (TWRS-P) Project.

The purpose of this paper is to summarize the status of these initiatives and to provide DOE contractors with general recommendations on issues to be considered as they attempt to manage the transition from the traditional DOE oversight system to more unique and independent regulatory regimes. These and other similar issues should be considered in order to assure that the transition is as efficient and cost-effective as possible.

**INTRODUCTION**

Contractors at U.S. Department of Energy (DOE) nuclear facilities that have grown accustomed to the traditional DOE oversight mechanisms and DOE Order system will face new challenges when they are confronted with the newly emerging forms of independent nuclear safety regulation at DOE facilities. “Independent” regulation of nuclear safety at DOE facilities includes not only potential “external regulation” by the Nuclear Regulatory Commission (NRC), but also DOE’s own efforts to create regulatory oversight and enforcement regimes that are separate and independent from the traditional contract-based oversight mechanisms.

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## **LESSONS LEARNED FROM THE NRC CERTIFICATION OF THE GASEOUS DIFFUSION URANIUM ENRICHMENT PLANTS**

In 1996, the NRC issued "certificates of compliance" to the United States Enrichment Corporation (USEC) for the continued operation of the Paducah, Ohio and Portsmouth, Kentucky uranium enrichment gaseous diffusion plants (GDPs). The certificates marked the culmination of a four-year process that began with the passage of the Energy Policy Act of 1992. In 1992, the GDPs were owned, operated, and overseen by DOE. The 1992 Act envisioned that while the GDPs would remain the property of DOE, they would be leased to a government corporation (USEC), operated by a contractor, and ultimately regulated by the NRC, with a view toward eventual privatization of USEC.

The transition to NRC regulation of the GDPs was the first time a major existing DOE facility had been placed under NRC regulation. The process was fraught with problems and "first of a kind" issues.

## **CONSISTENT INTERPRETATION OF REGULATORY REQUIREMENTS**

The Energy Policy Act required the NRC to develop standards for NRC regulation of the GDPs. In response, the NRC developed 10 CFR Part 76. Part 76 contained what appeared to be reasonable, performance-based standards. It seemed to avoid excessive prescriptive requirements, and was patterned after the NRC's existing 10 CFR Part 70 regulations applicable to the possession of special nuclear material.

USEC modeled its certification applications to the NRC on the NRC's existing standard license application format and content guides (which had been traditionally used by applicants for Part 70 licenses), as well as on a number of docketed and approved Part 70 license applications. The NRC Staff, however, rejected USEC's initial certificate applications, finding that they failed to provide sufficient information and detail. USEC, therefore, was required to significantly revise its applications, a process that delayed the certification by many additional months. Because the NRC Staff required a level of detail in the revised applications well in excess of the initial applications, USEC's regulatory commitments were significantly increased over what it had originally anticipated -- increasing proportionately the cost and complexity of USEC's compliance efforts.

What occurred provides an important lesson for future NRC regulation of DOE facilities. It became apparent during discussions with the NRC Staff following its rejection of USEC's initial applications, that there had not been an effective "meeting of the minds" between USEC and the Staff on the proper interpretation of the newly-developed Part 76. Unknown to USEC, the Staff considered the minimum acceptance criteria to be draft revisions to Part 70 and drafts of related guidance documents that had not yet been approved by the NRC. Use of these documents as minimum acceptance criteria resulted in a vastly greater level of detail and complexity than had been required of Part 70 license applicants up to that time.

DOE contractors required to obtain an NRC license or certification must ensure that there is a clear meeting of the minds between themselves and the NRC Staff regarding the NRC's regulatory requirements, and most importantly, what is required to demonstrate compliance with those requirements. One effective method for achieving that objective is for the contractor to hold a series of "subject matter" meetings with the appropriate NRC Staff members and to focus in depth on application content and level of detail issues.

Failure to come to such a meeting of the minds can lead to significant, unanticipated costs. In USEC's case, the majority of these initial costs were borne by DOE, but USEC (which is now a private corporation) is now bearing the continuing costs of the NRC's regulatory regime. Because of the trend toward contract reform and "fixed-price" DOE contracts, it is imperative for contractors to have a full and realistic understanding of NRC expectations when bidding or negotiating a contract price.

## **AUTHORIZATION FOR CONTINUED OPERATION DURING TRANSITION PERIOD**

Under the Energy Policy Act and Part 76, USEC was permitted to operate the GDPs during the transition period after certification, but before NRC requirements were fully implemented at the facilities. Part 76 envisioned a transitional period during which the facilities were under NRC oversight, but were working toward full compliance with all applicable NRC requirements.

10 CFR § 76.35 required USEC to provide, along with its application for certification, Plans for Achieving Compliance with respect to "any areas of noncompliance with the NRC's regulations . . . ." The Compliance Plans were required to include descriptions of the specific areas where the GDPs were not yet in full compliance with the applicable NRC requirements, schedules for achieving compliance, and justifications for continued operation with adequate safety and safeguards. Although the Compliance Plans created additional regulatory commitments, and sometimes required difficult negotiations with DOE, their benefit clearly outweighed their costs. They permitted an efficient, orderly, and gradual transition to achieving full compliance with NRC requirements, while at the same time, allowing the GDPs to continue to operate.

It seems likely that most, if not all, currently operating DOE facilities would not be in compliance with all NRC applicable requirements if there were an immediate transition to NRC oversight. Thus, DOE contractors should ensure that any transition to NRC oversight includes a compliance plan mechanism such as that utilized for the GDPs. Absent such a compliance plan,

DOE facilities could be required to cease operations or ongoing activities during the time necessary to come into compliance with NRC requirements. Accordingly, DOE contractors should press for legislation and/or regulation that, like Part 76, permits facilities to achieve compliance with NRC requirements according to a reasonable schedule, and with a reasonable expenditure of time and resources.

## **COSTS OF TRANSITION TO NRC REGULATION**

The costs associated with achieving compliance with NRC requirements at the GDPs were significant. Estimates range as high as about \$200 million. Clearly, DOE contractors faced with a possible transition to NRC regulation need to be aware that the costs to achieve compliance can be substantial. In an era of fixed-price contracts, contractors also must ensure that the risk for underestimating transition costs does not fall solely on them. Accordingly, the issue of transition costs should be addressed explicitly in any legislation transferring regulatory authority to the NRC as well as through carefully drafted risk-allocation provisions in the DOE contracts.

## **LESSONS LEARNED FROM THE NRC/DOE PILOT PROGRAM ON EXTERNAL REGULATION**

The July 7, 1997 Memorandum of Understanding (MOU) between DOE and NRC "Pilot Program on External Regulation of DOE Facilities by the NRC," established the framework for a pilot program that would provide information to the two agencies to facilitate a joint recommendation to Congress on whether NRC should be given statutory authority to regulate nuclear safety at DOE nuclear facilities. As envisioned in the MOU, the pilot program consists of teams of NRC and DOE personnel conducting "simulated regulation" at a number of DOE nuclear facilities over the course of two years. According to the MOU, simulated regulation is intended to:

- test regulatory concepts and evaluate a facility and its standards, requirements, procedures, practices, and activities against standards that NRC believes would be appropriate to ensure safety in view of the nature of the work and hazards at the pilot facility . .
- . . Simulated regulation will involve interactions with DOE, DOE's contractors, and NRC [and] will include NRC inspections of each pilot facility to identify issues related to implementation.

Pilot program reviews have been underway at the Lawrence Berkeley National Laboratory (LBNL), the Oak Ridge Radiochemical Engineering and Development Center (REDC), and the Savannah River Receiving Basin for Offsite Fuel (RBOF). Other pilots, including reviews at Pacific Northwest National Laboratory (PNNL), may be conducted in the future. However, as a result of directives from Congress contained in the Fiscal Year 1999 Energy and Water Development Appropriations Act Conference Report, progress on the pilot program has slowed considerably, and to date, no reports of the Task Force performing the pilot reviews have been issued publicly.

The Appropriations Act Conference Report required the NRC and DOE to revisit their work on the LBNL pilot and to now include consideration of Occupational Safety and Health Administration (OSHA) and state and local health and safety regulations. The Task Force was criticized for not considering these regulatory authorities in its original pilot review. Indeed, Congress directed that all future pilots address the respective roles and requirements of OSHA and the states and local governments, and not just NRC and DOE requirements. Congress also prohibited the conduct of future pilot reviews at DOE facilities with responsibility for weapons activities.

It is difficult at this stage, given the lack of publicly available information on the results of the pilot reviews, to identify lessons learned from this process. There is no question that the enthusiasm of DOE has cooled to the idea of broad-based external regulation of DOE facilities. However, it does not appear that NRC enthusiasm for the concept has cooled. From some of the information available from the LBNL pilot and experience on the GDP certifications, certain basic issues warrant discussion.

### **WHO WILL BE THE LICENSEE?**

At LBNL, DOE has expressed a strong preference that it, rather than the contractor (the University of California) should be the sole licensee. The NRC Staff, in response, is developing a proposed position on appropriate “license conditions” that would recognize the University as the operator, but not the licensee, for the LBNL facility, and would specify the respective roles and responsibilities of DOE and the University.

As a general matter, a DOE contractor would most likely desire to avoid becoming an NRC licensee and thereby avoid the attendant direct responsibility and accountability to the NRC to assure full compliance with all applicable NRC requirements. However, it is not at all clear that such an arrangement would be feasible in the context of an incentive or performance-based contract, or a privatized or fixed price contract. Under NRC regulations and developing policies, the NRC demands that the licensee assume overall control and authority over the conduct of licensed activities. The licensee assumes a non-delegable duty to the NRC to assure full compliance and therefore must have effective “control” over licensee activities.

The concept of “control” is presently evolving as the NRC attempts to define the “indicia” which constitute such control. The issue has arisen primarily in the context of requests to the NRC for non-licensees to assume substantial degrees of management authority at nuclear power plants and other NRC-related facilities. Entergy’s management services arrangement at the Maine Yankee plant and PECO Energy’s contract at Illinois Power Company’s Clinton Power Station are good examples. The NRC’s current criteria evaluate whether the operator has “final decision-making authority” over a range of key decisions such as:

- Decision to shut down for repairs
- Decision to start up the plant
- Approval of licensee event reports
- Decision on whether to make a 10 CFR 50.72 report
- Authority to make operability determinations

- Authority to change staffing levels
- Authority to control the terms of employment for licensed staff
- Authority to make organizational changes
- Decision to defer repairs
- Authority for quality assurance responsibilities (selecting audits, approving audit reports, accepting audit responses)
- Budget-setting and spending authority
- Decision to continue operation with equipment problems
- Authority over the design control of the facility
- Decision to continue operations or permanently cease operation

Would a contractor subject to an incentive-based or fixed price contract be willing to cede such authority to DOE, given the fact that decisions on many of these types of issues would have a significant impact on the “bottom line”? Experience with the NRC review process suggests that there may be ways to permit DOE to become the licensee, while still providing the contractor with protections from costly DOE decisions it may make as the licensee.

#### **WILL THE NRC INSIST UPON PROMPT DECOMMISSIONING?**

The LBNL Pilot Project has also raised the question whether prompt decommissioning of permanently shutdown facilities or inactive areas will be required once a DOE facility transitions to NRC regulation. NRC regulations mandate prompt decommissioning of such facilities and inactive areas, while under DOE requirements, no such prompt decommissioning would be required. Although the NRC has made reference to the “inherent flexibility in [its] rules to allow a reasoned and responsible approach to decommissioning,” in fact a case-by-case determination is required in order to extend the decommissioning schedules set forth in the regulations. One positive sign is that it appears that DOE has agreed that, at least at LBNL, it, rather than the contractors, should accept responsibility for providing the financial assurance for decommissioning in accordance with NRC requirements. This will avoid the imposition of this potentially costly requirement on the contractor.

#### **HOW WILL DOE CHANGE CONTRACTORS, IF DESIRED?**

DOE has traditionally exercised the right to replace its contractors at its discretion in accordance with its contract requirements. NRC regulation will inject a new set of issues into this process. In particular, NRC requirements preclude the direct or indirect transfer of ownership or control of a license without prior written NRC consent to the transfer. A specific request for consent must be submitted to the NRC and the NRC will consider issues such as the proposed new licensee’s technical qualifications, financial qualifications, and degree of foreign ownership or control, in determining whether to approve such a transfer. Needless to say, this process could complicate, if not in some cases preclude, transfer of operating responsibility to a new DOE contractor.

Although this issue arose in connection with the LBNL Pilot Project, its resolution is being deferred to the Oak Ridge REDC Project.

## How Will the NRC's Developing Part 70 Regulations Affect the Contractor?

According to the NRC, the pilot review of the Savannah River Site RBOF has indicated that DOE and its contractor Westinghouse “control risks to acceptable levels,” and that with the exception of safeguards issues, the RBOF is “amenable to NRC regulation under 10 CFR Part 70.” Furthermore, criticality safety issues have emerged at both REDC and RBOF.

Of necessity, the pilot program cannot realistically perform full licensing reviews at pilot DOE facilities. Assumptions must be made and conclusions drawn based on less than complete information, and presumably, on judgments as to whether existing contractor programs, procedures and facilities conform to the intent of NRC requirements. In this environment, it is easy for the NRC to conclude that such existing programs, procedures and facilities “generally conform” to NRC regulatory requirements.

Contractors should be very cautious in relying on such conclusions. Experience shows that there will inevitably be a wider gulf between the existing facility configuration and what is required for NRC licensing or certification once contractors are subjected to detailed licensing reviews by NRC subject matter experts in each relevant area of their operations. It is at this latter stage that “general conformance” will no longer be acceptable, that contractors will be asked probing questions on their methods for assuring compliance, and that the true costs of NRC regulation will emerge. It is telling to recognize that when the NRC first contemplated regulating the GDPs, NRC management asserted that the plants had operated safely under DOE oversight and that documenting the “existing” safety programs and controls in the certification applications would go a long way toward obtaining NRC certification. Several years and hundreds of millions of dollars later, the NRC's real expectations and the true costs of NRC regulation are now apparent.

## **LESSONS LEARNED FROM THE DOE REGULATORY UNIT OVERSIGHT OF THE TWRS-P FACILITY**

The Hanford Tank Waste Remediation System-Privatization (TWRS-P) Project is subject to an entirely new and independent nuclear regulatory regime under the auspices of DOE's Office of Radiological, Nuclear and Process Safety (Regulatory Unit). The TWRS-P Project represents the highest profile privatization effort to date in the DOE complex. The contractor, British Nuclear Fuels Limited, Inc. (BNFL) has the task of removing, processing and vitrifying the high and low-level radioactive waste in the underground Hanford tanks safely and in accordance with a new regulatory regime different from both traditional DOE oversight and traditional NRC regulation. This new regime was established, at least in part, to facilitate a potential transition to NRC regulation of the TWRS-P, many years in the future.

The specially-chartered RU will oversee the design, construction, operation and deactivation (but not decommissioning) of the facility through a series of contractual requirements and newly created regulatory standards. Compliance with existing DOE Nuclear Safety Regulations will be required and enforcement action for violations may be taken.

In addition, however, one of the interesting aspects of the regulatory system set up for the TWRS-P Project is that the RU will closely regulate the “process” used by the contractor to arrive at facility-specific design criteria, safety controls, structures, systems and components relied on for safety, and administrative programs. BNFL will be required to follow, document and demonstrate compliance with an “integrated safety management” process defined in applicable RU regulatory standards and to “tailor” a set of requirements, standards and criteria that will assure safe facility operations. Compliance with the “process” will be as important as compliance with substantive requirements and standards, such as the DOE Nuclear Safety Regulations or Top-Level Standards established by the RU specifically for the TWRS-P Project.

This new regulatory regime poses unique challenges for both the contractor and the RU. While the RU will regulate the “process” as described above, it must provide the contractor with reasonable flexibility to utilize its own experience and best practices in tailoring a set of safety controls that will govern facility design, construction and operation. It cannot and should not substitute its judgment for that of the contractor if the contractor’s approach is reasonable and technically defensible.

Furthermore, there are unique “communications” challenges that face the contractor and the RU. In connection with the GDP certification, the NRC and USEC did not initially have a “meeting of the minds” in interpreting the applicable regulatory requirements, even though those requirements were based, at least to some degree, on past experience and precedent. The TWRS-P regulatory regime is entirely new. Neither party has experience in “applying” the standards and requirements to actual design, construction and operating activities. There are no direct precedents on which to draw for guidance or interpretation. Close communication will be critical, as will reasonable accommodation by both parties of the other’s positions and interpretations.

## **CONCLUSION**

The GDP experience, the NRC/DOE Pilot Program, and the RU’s regulation of the TWRS-P Project provide important sources of information on the pitfalls and issues that must be considered in the transition from traditional DOE oversight to new, independent forms of regulation. This paper discusses some of the most significant issues that have arisen to date. There are many other similar and more detailed implementation issues that cannot be discussed in this paper, but which nevertheless, should be understood and considered by a DOE contractor facing potential external or independent regulation.