

April 8, 1999

FOR: The Commissioners

FROM: William D. Travers /s/  
Executive Director for Operations

SUBJECT: POTENTIAL MODIFICATION OF THE DOE/NRC MOU DUE TO CHANGES IN THE HANFORD TANK WASTE REMEDIATION SYSTEM  
PRIVATIZATION

## PURPOSE:

To inform the Commission of changes in the U.S. Department of Energy (DOE **EXIT**) program for Hanford Tank Waste Remediation System Privatization (TWRS-P), and obtain approval for negotiating potential modifications to the "Memorandum of Understanding Between the Nuclear Regulatory Commission (NRC) and the Department of Energy: Cooperation and Support for Demonstration Phase (Phase I) of DOE Hanford Tank Waste Remediation Privatization Activities," January 15, 1997, 62 FR 12861 (MOU, attached).

## SUMMARY:

NRC and DOE negotiated the original MOU based upon a two phase approach for the TWRS-P. Phase I was to involve the design, construction, and operation of relatively small, pilot plant facilities to demonstrate technologies and treat a small percentage of the tank wastes (6-13%), with completion and deactivation within 10-15 years. The potential transition to NRC regulation would occur sometime prior to the start of final design and construction of full-scale facilities for Phase II. During Phase I, the DOE was to acquire the capability to implement a program of nuclear safety and safeguards regulation consistent with NRC's regulatory approach. During Phase I, NRC was to acquire sufficient knowledge and understanding of the physical and operational situation at the Hanford waste tanks and the processes, technology, and hazards involved in the Phase I activities, and to enable NRC to (a) assist DOE in performing reviews in a manner consistent with NRC's regulatory approach and (b) be prepared to develop an effective and efficient regulatory program for the licensing of DOE contractor-owned and contractor-operated facilities that will process waste at Hanford during Phase II.

However, after the conclusion of the preliminary conceptual design efforts in Phase I, DOE evaluated submittals from two contractors, and selected one contractor to proceed further with design activities leading to the eventual construction and operation of TWRS-P facilities. In addition, DOE decided on a larger, Phase I facility that would be reused and expanded during Phase II, with a design life of at least 30 years, thus reducing the distinction between the two Phases. Such a facility, if not initially designed and constructed to meet NRC requirements and regulations, might require additional efforts and costs to meet those requirements and regulations if they are imposed at a later date. This changes NRC's role and the potential timing of regulatory transition, if any.

Both the NRC and DOE staffs agree on the need to reevaluate NRC's role in light of the changes in the TWRS privatization approach. The NRC staff believes that this reevaluation should occur in the near term and identify appropriate roles for the NRC, and include potential recommendations for revisions to the 1997 MOU to the Commission and to DOE management. As noted in [Attachment 2](#), DOE's Richland Operations Office would like to continue the current collaboration, perhaps with more NRC assistance (including closer ties) to the DOE, at least through FY 2001 when the review of the Contractor's construction Authorization Request is expected to occur. The NRC staff believes that a revised MOU should include a definitive, mutually agreeable commitment and schedule regarding seeking transition of regulatory authority to NRC, or a commitment of NRC providing technical support to DOE without an assumption that the resulting facility would meet NRC licensing requirements. The latter approach may facilitate less-independent NRC involvement (e.g., participation on DOE inspection and review teams, or other activities), while continued NRC maintenance of independence from DOE activities appears appropriate under the former approach.

[Attachment 1](#) is an Issue Paper which discusses these points in more detail, and recommends evaluating and negotiating changes to the MOU. A draft of this Issue Paper has been discussed with DOE, and no formal comments have been received. [Attachment 2](#) is a letter from DOE, indicating that the collaboration with NRC has been very productive, and that DOE believes its interests are best served by maintaining the status quo, at least through FY 2001. [Attachment 3](#) is a copy of the NRC/DOE MOU. [Attachment 4](#) is a copy of the DOE report to Congress on the TWRS-P Phase I Project.

## RESOURCE IMPLICATIONS:

A general-fund line-item has been included in NRC's annual budget requests, specifically for NRC staff TWRS activities and technical support from the Center for Nuclear Waste Regulatory Analysis. The development of revisions to the MOU has no near term NRC resource implications (i.e., no additional effort or funds beyond those currently available would be required), because activities such as defining NRC's role and regulatory approach are within the scope of the current Phase I activities and MOU relationship with DOE.

Current resource needs were formulated based upon the assumption of near term regulatory transition and the current MOU's NRC-DOE relationship. [SECY-98-029](#) provides details on the staff's estimated and actual costs of NRC involvement in TWRS under the MOU. DOE's revised contractual approach and any associated MOU revisions are likely to impact NRC resources and resource planning, insofar as NRC's roles and responsibilities and the timing of transition may be redefined. The staff will provide to the Commission the staff's evaluation of possible effects on NRC resources along with the options for NRC roles and responsibilities when the staff seeks Commission endorsement of a revised MOU with DOE.

## RECOMMENDATION:

The staff recommends that the Commission:

- (1) authorize NRC staff to negotiate, with DOE, draft modifications of the MOU that will address the changes in the program and include exploring the pros and cons of proposing legislation to clarify NRC's roles and responsibilities; and
- (2) direct NRC staff to provide for Commission approval, options for future NRC roles and responsibilities regarding TWRS along with associated, draft revisions to the MOU and any resource implications.

COORDINATION:

The Office of General Counsel has reviewed this paper and has no legal objection to its contents.

The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections.

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Attachments: 1. The Issue Paper  
2. DOE letter, dated December 23, 1998  
3. MOU between NRC and DOE on TWRS-P  
4. DOE Report to Congress on "Treatment and Immobilization of Hanford Tank Waste"

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ATTACHMENT 1

ISSUE PAPER  
FEBRUARY 4, 1999

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IMPORTANT CHANGES TO THE U.S. DEPARTMENT OF  
ENERGY'S HANFORD TANK WASTE  
REMEDIATION SYSTEM PRIVATIZATION

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- PURPOSE:
- 1. BACKGROUND:
- 2. RECENT, MAJOR REVISIONS IN THE DOE APPROACH:
- 3. IMPACTS UPON NRC INVOLVEMENT:
- 4. REEVALUATION OF NRC'S ROLE

PURPOSE:

An Issue Paper may be used to solicit views of the U.S. Nuclear Regulatory Commission (NRC) staff or to consider the views of other Federal departments or agencies and coordinate these, to the extent possible, in order to develop a staff-recommended position.

This issue paper will describe and discuss: (1) the background and original working relationship between the NRC and DOE; (2) recent, major revisions to the U.S. Department of Energy's (DOE's) Hanford Tank Waste Remediation System (TWRS) privatization approach; (3) the possible impacts of these revisions on NRC involvement and role under the January 29, 1997, NRC-DOE Memorandum of Understanding (MOU) for cooperation and mutual support for the demonstration phase (Phase I) of the TWRS project; and (4) the staff's belief that a reevaluation of NRC's role and participation may be necessary and appropriate as a result of these revisions, including potentially revising the MOU.

1. BACKGROUND:

Under its original approach (i.e., before August 1998) to privatization of the Hanford tank remediation, DOE would have regulated the contractor-owned and -operated, pilot-sized, demonstration TWRS facilities during Phase I, and DOE proposed that NRC regulate the design, construction, and operations of contractor-financed, -owned, and -operated production facilities (Phase II). When the original approach was conceived, Phase I construction was expected to begin in December 1999, with operations beginning in June 2002. Phase II design and construction were expected to occur in parallel, with Phase II operations starting around 2004.

The original, two-phased approach had several advantages in that it accommodated: (1) DOE's scheduling interests, specifically those related to the Hanford Federal Facility Agreement and Consent Order, also known as the Tri-Party Agreement (TPA), between DOE, the U.S. Environmental Protection Agency, and the Washington State Department of Ecology; (2) DOE's interest in privatizing certain DOE activities; (3) contractor interests regarding the difficulty of formulating fixed-price proposals for privately financed full-scale facilities, given uncertainties in the waste material and treatment technologies; (4) time to identify and seek needed legislative clarifications before possible regulation by NRC; and (5) NRC's ability to prepare and develop an effective and efficient regulatory program before transition.

NRC committed, through the January 29, 1997, NRC-DOE MOU , to support DOE, during Phase I, to help facilitate the potential regulatory transition to NRC at the start of Phase II. DOE established the Regulatory Unit (RU) to regulate the TWRS Phase I privatized contractor activities in a manner that assures adequate radiological, nuclear, and process safety by application of regulatory concepts and principles consistent with those of NRC. Under the MOU the staff has been developing the necessary NRC regulatory program and staff expertise in anticipation of possible NRC regulation; assisting DOE's RU in developing a DOE Phase I regulatory program that is consistent with NRC's regulatory approach; and advising the RU on technical issues and reviews of the contractors' submittals. In so doing, the staff has been attentive to the need to maintain an appropriate level of independence from the DOE TWRS Regulatory Unit, in keeping with the NRC's objectives of avoiding any potential appearance of conflict of interest that the public may perceive as the NRC works with DOE to regulate these facilities and by establishing credibility as a clearly independent peer reviewer.

From September 1996 to May 1998, British Nuclear Fuels Limited, Inc. (BNFL) and Lockheed Martin Advanced Environmental Systems (LMAES) were competing contractors under separate contracts for Phase I of the TWRS project. In the TWRS privatization approach, Phase I had two parts: Phase IA was a 20-month development period ending May 25, 1998; and Phase IB was a multi-year follow-on, proof-of-concept, and commercial demonstration-scale effort. In January 1998, under terms of the Phase IA contract, each contractor submitted its proposal to DOE for design, construction, and operation of the treatment and immobilization facilities for Phase IB. In May 1998, DOE terminated the Phase IA contract and Phase IB negotiations with LMAES because of programmatic and technical concerns. On July 21, 1998, DOE submitted a report to Congress<sup>(2)</sup> on the proposed follow-on contract with BNFL, and on August 24, 1998, DOE signed a new contract with BNFL.

## 2. RECENT, MAJOR REVISIONS IN THE DOE APPROACH:

In its report to Congress, DOE characterizes the new BNFL contract as reflecting an evolution of the original TWRS privatization approach. Differing from the original approach, during the first 2 years, Phase IB design will proceed to about a 30 percent design level with DOE funding; then a decision will be made on whether to proceed with Phase IB construction and operations. This approach allows design work to proceed without delay, but defers (for 2 years) a final decision to proceed with construction and operation of the project. The deferral permits further refinement of the design, technical approach, regulatory requirements, contractor financing and investment arrangements, and the contract and fee structure, before DOE and BNFL enter into an estimated \$6.9-billion contract.

The new agreement differs in key respects from the original plan, with increased cost and different contractual arrangements, including a longer, cost-reimbursable portion. DOE exercised an alternative route in the TPA that defers LAW solidification (a several year delay in startup of low-activity waste vitrification operations, a TPA milestone) in exchange for more expedient HLW retrieval from the tank farms and processing in TWRS-P (a several year acceleration in a HLW TPA milestone). This TPA milestone exchange provides DOE and its contractor with additional time to design, negotiate, construct, and operate the TWRS-P facility. More notably, from NRC's perspective, the BNFL facilities will have a 30-year design life and will accommodate expansion (i.e., installation of additional processing lines), instead of the originally planned approach of shorter design life (5- to 9-year) Phase I demonstration facilities. If expanded, the BNFL facility is estimated to be capable of processing 55 to 65 percent (by mass) of the tank waste by 2028, including approximately 95 percent of the long-lived radionuclides. (The TPA date for DOE completion of all tank waste immobilization is 2028.) The DOE's report to Congress estimates that a parallel, similar-capacity facility would be required around 2016, to complete the TWRS cleanup mission by 2028.

DOE now defines Phase I as the current 24-month design phase, followed by a construction and operations phase of the 30-year design-life facility, to process about 6-13 percent of the waste volume and 20 to 25 percent of the activity. DOE currently forecasts that Phase I waste treatment will begin around 2005 or 2006 and continue for about 10 years. Presumably, the expansions to the Phase I facility and the possible parallel facility would be Phase II activities.

## 3. IMPACTS UPON NRC INVOLVEMENT:

Although DOE originally approached NRC to license the TWRS facility from the very outset (i.e., NRC regulation of both Phase I and Phase II activities), neither the new contract nor the report to Congress directly addresses DOE's plans for the transition to NRC regulation of the BNFL facilities, nor does either one address the impacts of the new approach on the timing of the possible transition. However, the report does indicate that NRC's participation during Phase I would remain ". . . primarily of a cooperative nature for the purposes of information transfer and assisting DOE in establishing a regulatory program that is consistent with the NRC's regulatory approach." The report also indicates that DOE is maintaining eventual NRC regulation for Phase II as a possible outcome, by stating, ". . . the lead time for Phase II will allow the NRC to have the necessary legislative and regulatory framework to assume regulatory oversight." It also indicates that DOE will initiate planning for Phase II during the initial 2-year design period. Based on these statements and discussions with DOE, the eventual transition to NRC of regulatory authority for the TWRS privatization may still occur; however, potential, transition to NRC of regulatory authority may be delayed significantly, possibly until about 2015.

The staff believes that a reevaluation of NRC's role and participation is needed because of the changes in DOE's TWRS approach. A major factor in reevaluating NRC's Phase I role concerns the timing for transition to NRC regulation. DOE's report to Congress indicates that the Phase II request-for-proposals and procurement process would begin around 2010. If NRC regulation begins several years after that (around 2015), then this is a significant change from DOE's originally envisioned two-phased approach, in which NRC regulation of Phase II was planned to begin around 2004, about the same time as the original Phase II design efforts, and consistent with the NRC's licensing process. Under the original approach, there was little likelihood that Phase I design decisions would affect NRC licensing, because of the short design life of the Phase I facility and the fact that the Phase I demonstration facilities were to remain under DOE regulatory oversight. However, DOE's new approach (i.e., with significant and accelerated design of the full scale facility [e.g., the portions of the facility common to both phases and originally intended for possible NRC regulation in Phase II] already initiated) may result in the design and construction of a facility that NRC may not be able to license on regulatory transition without either increased costs and delays, due to the need for possible retrofits, the need to consider exemptions, or to seek legislative authority and implementing rulemaking to allow for certifying what would become an existing facility constructed outside of the normal NRC approach.

NRC has undertaken a number of actions to facilitate the eventual regulatory transition since NRC was first informed of DOE's intentions for regulation of the TWRS-Privatization facility.

These actions include forming a dedicated organization within the Office of Nuclear Material Safety and Safeguards (NMSS) to support TWRS activities, and establishing contractual arrangements for independent technical assistance support from the Center for Nuclear Waste Regulatory Analyses (CNWRA). NMSS TWRS staff has participated in the pending revision of 10 CFR Part 70 to ensure its applicability to TWRS activities; has developed a TWRS-specific draft Standard Review Plan; and, with CNWRA technical assistance, has supported the RU in the development of review guidance for contractor submittals and reviews of those submittals. NMSS now possesses experienced and competent professional staff who understand the potential hazards posed by a TWRS facility, and has been effectively using that knowledge in developing a regulatory framework applicable to the TWRS privatization. During this period, by establishing credibility as a peer review organization that is separate and independent of DOE, the staff has managed to maintain a level of independence from DOE, in keeping with the NRC's objectives of avoiding the appearance of any potential conflict of interest that the public may perceive as the NRC works with DOE. DOE has found the existing collaboration with the NRC to be very productive, as stated in their letter of December 23, 1998.

#### 4. REEVALUATION OF NRC'S ROLE

Both the NRC and DOE staffs agree on the need to reevaluate NRC's role in light of the changes in the TWRS privatization approach. The staff feels that this reevaluation should occur in the near term and identify appropriate roles for the NRC, and include potential recommendations for revisions in the 1997 MOU to the Commission and to DOE management. DOE would like to continue the current collaboration, perhaps with more NRC assistance (including closer ties) to the DOE, at least through FY 2001 when the review of the Contractor's Construction Authorization Request is expected to occur. The staff believes that a revised MOU should include a definitive, mutually agreeable commitment and schedule regarding seeking transition of regulatory authority to NRC, or a commitment of NRC providing technical support to DOE without an assumption that the resulting facility would meet NRC licensing requirements. The latter approach may facilitate less-independent NRC involvement (e.g., participation on DOE inspection and review teams, or other activities), while continued NRC maintenance of independence from DOE activities appears appropriate under the former approach.

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1. "Memorandum of Understanding Between the Nuclear Regulatory Commission and the Department of Energy: Cooperation and Support for Demonstration Phase (Phase I) of DOE Hanford Tank Waste Remediation System Privatization Activities," January 15, 1997, 62 FR 12861.

2. "Report to Congress. Treatment and Immobilization of Hanford Radioactive Tank Waste," U.S. Department of Energy, July 1998.