



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 17, 1999

MEMORANDUM TO: Chairman Dicus  
Commissioner Diaz  
Commissioner McGaffigan  
Commissioner Merrifield

FROM: William D. Travers   
Executive Director for Operations

SUBJECT: STATUS OF THE U.S. DEPARTMENT OF ENERGY'S CORRECTIVE  
ACTION PROGRAM

The staff committed to provide you a report by October 1999 on the U.S. Department of Energy's (DOE's) activities to verify correction of quality assurance (QA) problems in its program for a repository at Yucca Mountain, Nevada. However, given the pace of DOE's efforts, we have concluded that DOE will not have verified the success of its corrective actions by October. We are informing you of this fact now in the context of the discussion that follows.

In any application for a license for a high-level waste repository at Yucca Mountain, DOE will need to show that it has complied with the U.S. Nuclear Regulatory Commission's (NRC's) requirement to implement a 10 CFR Part 50, Appendix B type QA program, as applicable, for all structures, systems, and components important to safety, design, and characterization of barriers important to waste isolation, and to activities related thereto. We believe that DOE's application of a rigorous and effective QA program to its site investigation and research activities is crucial to its ability to demonstrate the validity of its findings and analyses in any repository licensing proceeding.

The requirements of an Appendix B QA program are more extensive than those usually practiced by many of the personnel associated with the various participants in the Yucca Mountain project, such as the Management and Operating Contractor, U.S. Geological Survey; Los Alamos National Laboratory (LANL) and other national laboratories; and suppliers of items and scientific data associated with geological and geophysical field work and research. The unfamiliarity of personnel with the QA requirements, and the perceived time, effort, and expense of implementing the QA program appear to have caused some organizations to inadequately implement the program requirements.

We performed our first QA audit of the DOE high-level waste (HLW) program, at LANL, in June 1987. This audit identified problems in development and implementation of procedures, and preparation and maintenance of records. In January 1988, DOE published the Consultation Draft Site Characterization Plan (CDSCP), a draft of the Site Characterization Plan mandated by the Nuclear Waste Policy Act. Based on the LANL audit and other information, we identified an objection to the CDSCP based on QA, which stated that we had an insufficient basis to have

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confidence in the DOE QA program. We then had numerous meetings with DOE to discuss improvement of its QA program and NRC staff observations of DOE QA audits of various participants in the HLW program.

We lifted our objection on March 2, 1992, by letter from Robert Bernero, NRC, to John Bartlett, DOE, based on improvements in the DOE QA program. However, the letter did note that although all the organizations participating in the site characterization activities had developed and were implementing QA programs meeting NRC requirements, NRC staff would continue to monitor implementation through future audits and surveillances. Problems continued to arise in the DOE QA program, as evidenced in Robert Bernero's October 13, 1994, letter to Daniel Dreyfus, DOE, regarding "Concerns with Quality Assurance Program."

Because of budget constraints, and the perception that the DOE QA program was being effectively implemented, NRC's QA overview in fiscal year (FY) 1996 and FY 1997 was limited to the On-Site Representative (OR) who was a senior QA Engineer. In response to indications of recurring problems in the DOE QA program, as identified mainly by the OR, a QA engineer was added to the HLW Branch in October 1997.

More recently, concerns with the DOE QA program were identified by the NRC ORs in Las Vegas, Nevada, as well as the Clark County, Nevada, Nuclear Waste Division and the State of Nevada Agency for Nuclear Projects. Although DOE was aware of the deficiencies, which had generally been identified by its own QA staff, the steps taken by DOE and the participants to correct the deficiencies and preclude recurrence were insufficient. Many of the deficiencies were related to technical data, procurement of materials and services, software development, and model development and use -- items that could be required to support eventual site recommendation and licensing.

These recent expressions of concern resulted in extensive discussions of QA problems in the December 9, 1998, meeting between NRC and DOE. In this meeting, DOE acknowledged the QA deficiencies and presented its latest QA recovery program. Based on past experience with DOE attempts to correct deficiencies in its HLW QA program, we established a QA Task Force to review and evaluate the DOE QA recovery program, as documented by a memorandum from Carl J. Paperiello, dated January 22, 1999. The Task Force was composed of six people, including the NRC OR and the Center for Nuclear Waste Regulatory Analyses (CNWRA) QA Manager, under the direction of the Division of Waste Management (DWM) Division Director. The Task Force has been active in reviewing DOE's progress, and has issued periodic reports to the DWM Division Director. Further, in June 1999, a Senior QA Engineer was added to the HLW Branch and the QA Task Force.

Although the QA staffs of DOE and its contractors were successful in identifying the QA program deficiencies in the various participants' programs, and, in many cases, highlighting the repetition of similar deficiencies, indicating inadequate corrective action was taken to correct the initial deficiencies, the DOE line organizations responsible for correcting the deficiencies were not held accountable or forced to take effective corrective action. DOE has stated that it now realizes that correction of the QA program deficiencies is essential to possible licensing of the Yucca Mountain repository and is taking action to correct the problem. NRC is evaluating whether this program will be more successful than similar recovery programs attempted in the past.

Our recent efforts to date, which include: (1) meetings with DOE and participants; (2) observation of DOE QA audits; and (3) reviews of DOE and participant documents, indicate that many of the deficiencies are being corrected. DOE is identifying the items that are expected to be required to support any license application (LA) (as well as any site recommendation before the LA) and, thus, are required to be qualified under the QA program. DOE is also reviewing and documenting the traceability of data previously obtained by participants; it is reviewing purchase orders for conformance with QA requirements; and it is reviewing computer codes and models and will validate them, as required. DOE also issued new or revised procedures to control future work at the end of June 1999, as part of the Process Validation and Re-Engineering program.

Besides maintaining our present overview activities of DOE, additional planned activities for FY 2000 include: (1) increasing the number of HLW Branch observations of DOE QA audits by 50 percent; (2) using considerably more CNWRA QA resources to overview DOE activities; and (3) strengthening the Headquarters technical staff's participation in OR activities at the various DOE facilities. We believe that our present overview activities, along with our increased planned activities for FY 2000, provide the ability to adequately evaluate whether the DOE QA program will continue to be effectively implemented.

We believe that DOE is taking the proper steps to correct its HLW QA program deficiencies. These steps involve both the identification and qualification, as necessary, of data and software, etc., developed under the QA program in place before the end of June 1999, and the implementation of the new procedures that became effective at the end of June.

However, DOE is unlikely to have fully implemented its corrective actions, and to have performed sufficient work for NRC evaluation under its revised procedures, before March 2000. At that time, the NRC staff could assess the effectiveness of DOE corrective actions taken to assure the quality of work performed since the end of June 1999.

Further, although DOE expects to have identified most of the data requiring reverification by the end of October 1999, it is unlikely to have fully qualified the past work (performed before the implementation of the corrective actions) required to support all inputs for the Final Site Recommendation (SR) in 2001. This conclusion has been reinforced by Mark Tynan's statement at the June 30, 1999, meeting of the Nuclear Waste Technical Review Board -- that DOE hopes the vast majority of the required data sets will be qualified by the time of the final site recommendation. This DOE representative's statement was also supported by DOE's Lake Barrett.

Our latest information from DOE is that: 1) the qualification and validation of inputs for the SR will be prioritized and evaluated in order of their importance; 2) approximately 50 percent of the inputs for the SR will be qualified by the end of May 2000; 3) approximately 80 percent of the inputs for the SR will be qualified by mid-January 2001; and 4) at the time the SR is issued in a proposed form for NRC review in November 2000, the most critical inputs for the SR would be qualified, with approximately 20 (+) percent of the inputs not qualified. Also, DOE has stated that the inputs for the SR would be the basis for the LA and that all inputs for the LA would be qualified before the LA is transmitted to the NRC.

The Commissioners

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We will continue to monitor DOE's progress and provide status reports to the Commission. In conclusion, we believe that DOE present corrective actions, if properly implemented, should correct past deficiencies in its QA program implementation. We also believe that the staff's planned actions will adequately evaluate whether DOE continues to effectively implement its QA program.

cc: OGC      OPA  
     SECY     OCA  
     OCFO     OCIO