

UPDATE ON THE REMOTE-HANDLED TRU WASTE PROGRAM AT THE WASTE ISOLATION PILOT PLANT

W. A. Most, R. F. Kehrman
Washington Regulatory and Environmental Services
4021 National Parks Highway, Carlsbad, NM 88220

ABSTRACT

Commencement of disposal operations of Remote-Handled transuranic (RH TRU) waste at the Waste Isolation Pilot Plant (WIPP) relies upon completion of two major requisites—obtaining the regulatory agency approval of RH TRU waste characterization plans and facility readiness. Since the submittal of these RH TRU authorization basis documents, information has been formally exchanged between the Department of Energy/Carlsbad Field Office (CBFO) and the regulatory agencies regarding the technical aspects of the requests. Plans to characterize, ship, and receive RH TRU waste are being developed at the generator/storage sites and at the WIPP facility.

INTRODUCTION

The Department of Energy's Waste Isolation Pilot Plant (WIPP) is a deep geologic repository for the safe and environmentally sound disposal of transuranic (TRU) and TRU-mixed waste from defense activities of the United States. Radioactive and hazardous wastes are disposed in ancient salt beds 2150 feet below the surface. The WIPP received the necessary radioactive and hazardous waste permits and commenced disposal operations in 1999. The regulatory agencies, however, only approved the WIPP for Contact-Handled (CH) TRU waste. To dispose of Remote-Handled (RH) TRU waste the WIPP would have to submit waste analysis plans to the respective agencies (the US EPA and the New Mexico Environment Department) for their review and approval. The generator/storage sites must be ready to characterize RH TRU waste in accordance with the approved waste analysis plans and the WIPP facility's procedures, systems and equipment must be configured to safely manage, store, and dispose of RH TRU waste.

BACKGROUND

Commencement of disposal operations of RH TRU waste at the WIPP relies upon completion of two major elements: 1) receiving regulatory agency approval of RH TRU waste characterization plans and 2) facility readiness. Since the submittal of the *Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit Class 3 Permit Modification Request* [1] for the RH TRU waste analysis plan and facility changes (RH PMR) information has been formally exchanged between the Department of Energy/Carlsbad Field Office (CBFO) and Washington TRU Services, LLC, who are the Co-operators of the facility, and the New Mexico Environment Department (NMED) the regulatory agencies regarding the technical aspects of the requests. Likewise, the CBFO and the EPA have had formal technical interchanges since the submittal of the *Notification of Planned Change to the EPA 40 CFR 194 Certification of the Waste Isolation Pilot Plant; Remote-Handled Transuranic Waste Characterization Plan* [2] (RH Notice).

STATUS OF THE RH PERMIT MODIFICATION REQUEST

The Co-Permittees submitted the RH PMR to the NMED on June 28, 2002. The RH PMR has two components: the RH TRU waste analysis plan and the facility changes to procedures, systems, and equipment necessary to safely manage, store, and dispose of RH TRU waste. The New Mexico Environment Department issued a Notice of Deficiency [3] (NOD) to the RH PMR on March 5, 2003. The NMED provided for a 60-day period in which to respond to the NOD comments. Not requesting an

extension of the 60-day response period, the Co-operators submitted their response to the RH PMR NOD on May 5, 2003. Generally, the NOD comments focused upon the areas of enforceability, a reasoned departure from the Contact-Handled TRU waste analysis plan, use of acceptable knowledge, waste stream identification criteria, and facility operation and closure.

During technical exchanges with NMED, the agency had repeatedly stated that if the WIPP was to request a reduction in the existing permit waste analysis plan requirement, it must be technically justified and not merely based upon the hazardous waste regulations. In the transmittal letter, the Co-operators requested clarification of the current legal standard for any changes to the WIPP Hazardous Waste Facility Permit, whether it was the current permit or existing law, and regulatory requirements. On August 8, 2003, the NMED sent a partial response to the WIPP NOD response addressing the current legal standard. The NMED stated that indeed that existing law and the New Mexico Hazardous Waste Act and New Mexico Hazardous Waste Management Regulations were the basis for changes to the existing permit; nonetheless, the fully adjudicated WIPP Hazardous Waste Facility Permit has been fully demonstrated to satisfy existing legal and regulatory standards. WIPP is still awaiting the reply from the agency regarding the WIPP's NOD response.

RH EPA NOTICE OF PLANNED CHANGE

The CBFO submitted the *Notification of Planned Change to the EPA 40 CFR Part 194 Certification of the Waste Isolation Pilot Plant* on December 16, 2003. A sister document accompanied the RH Notice as part of the submittal to EPA, the *Waste Characterization Process Implementation Plan* [4] (WCPIP). The WCPIP communicates to the regulators and the characterization personnel at the generator sites how the waste will be characterized in a general fashion. The WCPIP is a performance driven approach to characterization, allowing for the variability of facilities and waste forms around the DOE complex. Thus, the WCPIP tells the generators what must be known about the waste in order to ship the waste to the WIPP. The generator selects the specific characterization methodology. Note that the waste characterization process is a performance-driven plan and not a performance-based plan as certain waste attributes must be obtained in a specific manner, such as surface dose rate. The dose rate must be measured using calibrated field instruments. Others waste parameters (e.g., physical form) can be determined using differing methods. Physical form data may be obtained using waste examination techniques (visual examination or radiography) of having qualified AK information.

Following the submittal of the (RH Notice), the Environmental Protection Agency (EPA) issued an August 1, 2003, letter to CBFO, communicating their thoughts on the adequacy of a key element of the Notice, the *Remote-Handled TRU Waste Characterization Program Implementation Plan* (WCPIP). The EPA offered two manners in which to proceed with a revision of the WCPIP—EPA's direct approval of generator site plans and procedures or by CBFO revising the WCPIP to be more enforceable. The final technical exchange regarding the WCPIP was submitted to EPA on November 7, 2003.

SITE CERTIFICATION AND RH CHARACTERIZATION DEMONSTRATIONS

Remote-Handled TRU waste generator/storage sites must be prepared to ship their RH TRU waste following agency approval of the permit modification request and Notice to meet projected shipping schedules in the National TRU Waste Management Plan, Rev. 3 [5]. To achieve maximum readiness to ship, the WIPP is proactively supporting the generator/storage sites by assisting in program development and evaluating the adequacy of the of known characterization programs elements to successfully gain the NMED and EPA approval of their waste characterization processes. This approach was first evaluated at Los Alamos on August 5, 2003, and other demonstration programs are being considered at other facilities.

Los Alamos National Laboratory

Resulting from a CBFO sponsored generator/storage site workshop in February 2003, the Los Alamos National Laboratory (LANL) performed an RH TRU waste characterization demonstration using one of the four prescribed methods at 40 CFR 194.22.b. to qualify data prior to the implementation of quality assurance program. Facilities who need to qualify this data use in their characterization of TRU waste may:

- Peer review, conducted in a manner that is compatible with NUREG-1297, "Peer Review for High-Level Nuclear Waste Repositories," [6]
- Corroborating data
- Confirmatory testing
- Quality assurance program that is equivalent **in effect** to NQA-1, NQA-2, and NQA-3 [7]

In August, LANL conducted a demonstration to the EPA Office of Radiation and Indoor Air that they had a QA program that was equivalent in effect with NQA1, 2, and 3. The LANL had the organizational elements of an NQA-1 program. However, since the LANL data and information was collected prior to the implementation of their quality assurance program, use of one of the aforementioned methods is required to qualify the data for characterization purposes. The demonstration was an informal surveillance of the LANL RH radiological characterization program for the 15 canisters of RH TRU waste that had been previously packaged. The canisters contained waste from the examination of fuel pin specimens from Argonne National Laboratories-East.

Los Alamos and WIPP Central Characterization Project representatives presented a synopsis of the hot cell operations that generated the waste, a summary of the AK information, and how radiological characterization was performed to members of the informal surveillance and other observers. More importantly, a crosswalk was developed that illustrated how the LANL program contains the required elements of the CBFO Quality Assurance Program Document [8] (QAPD). The CBFO QAPD is the CBFO NQA document. Figure 1: *QAPD Qualitative Chart*, shows the results of the crosswalk of LANL compliance with the QAPD requirements to the NQA-1 sections and NQA 2 and NQA-3.

The elements of NQA-2, *Software Requirements*, did not apply as no specialized software was used in the characterization. As for NQA-3, *Sample Control Requirements*, the NQA program elements did not apply to the LANL program of sampling the fuel pin specimens because at the time of the examination of the fuel pin specimens, the data collection was part of a scientific examination and not part of an effort to provide radiological or hazardous waste characterization information.

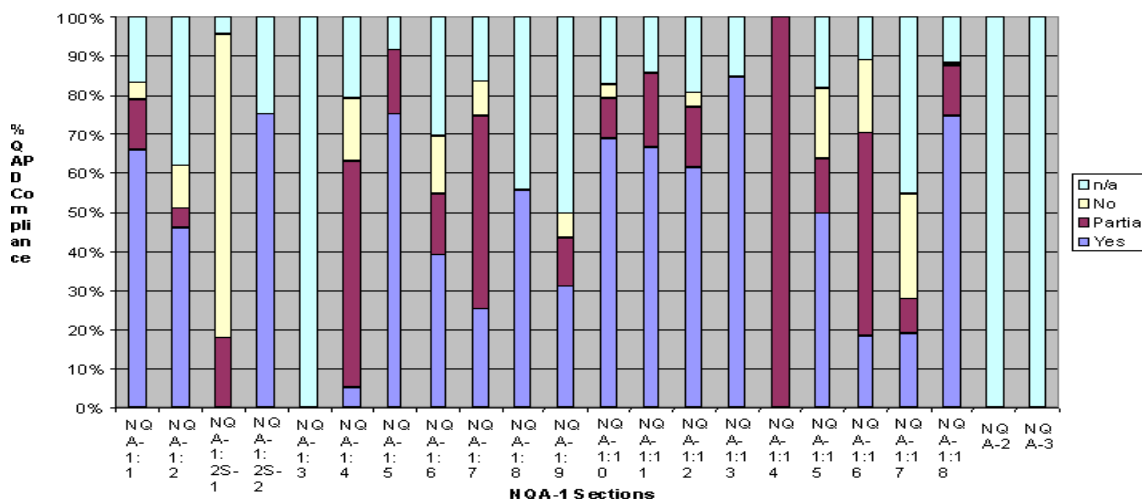


Fig. 1

QAPD QUALTATIVE CHART

The chart provides a graphic representation of the results of the document search performed to populate the QAPD Matrix. Documents were evaluated as to how squarely they addressed an NQA element, or if they were not applicable to NQA. Some elements weigh more heavily than others, such as how well the organizational elements of NQA-1 were met. Pending EPA’s informal critique of the demonstration, a formal audit will be scheduled.

Idaho National Engineering and Environment Laboratory

The Idaho National Engineering and Environmental Laboratory have 620 drums of RH TRU waste for which it is evaluating another of the four prescribed methods to qualify their data: peer review. The peer review must be conducted in a manner that is compatible with NUREG-1297, *Peer Review for High-Level Nuclear Waste Repositories*. To implement a peer review, CBFO has issued procedure MP 10.5, *Peer Review* [9], which details the responsibilities, requirements, and methodologies for performing a peer review. A Peer Review Plan and a Peer Review Management Plan were drafted. The CBFO is awaiting EPA’s evaluation of the LANL RH TRU waste demonstration before determining further action regarding the INEEL RH demonstration.

West Valley Demonstration Project

West Valley Demonstration Project (WVDP) has proposed that its TRU Waste Program be reviewed by Washington Regulatory & Environmental Services (WRES) ensure a seamless transition once WIPP Central Characterization Project (CCP) personnel commence characterization activities at their site. In support of West Valley’s need to implement a TRU waste program that will interface smoothly with CCP and obtain certification by the DOE’s Carlsbad Field Office, WRES will review the current West Valley program and procedures for generating, characterizing, packaging, and storing TRU waste, focusing on how these activities are performed in order to generate waste documentation that meet technical and

quality standards imposed by CBFO. Subsequently, WRES will then identify WVDP elements that comply with the CCP requirements as well as identify any deficiencies in the West Valley program and recommend program changes. A checklist will be generated for WVDP use in assessing program adequacy to maintain CCP program readiness.

Additionally, WRES/WSMS proposes develop user-friendly waste generation and documentation guidelines, in addition to procedures (e.g., packaging checklist to guide operators in documenting all the required information) so that the WVDP TRU waste is as close to "pre-certified" as possible in anticipation of CCP program commencement. Pre-certified is defined as waste that was packaged and documented under a program that meets the applicable technical and quality requirements of the CBFO.

WIPP FACILITY RH TRU WASTE OPERATIONAL READINESS REVIEW

Purpose of the RH TRU Waste ORR

Washington TRU Solutions, LLC (WTS) is the Management and Operating Contractor for the WIPP and as such will perform a RH Waste Disposal Operations Contractor Operational Readiness Review (ORR) as detailed by its Contractor ORR Plan of Action [10]. The purpose of the ORR is to demonstrate to CBFO that all formal processes, systems and equipment are in place to safely manage, store, and dispose of RH TRU waste at the WIPP. The Contractor ORR Plan of Action describes the breadth of the ORR and the prerequisites that must be met to start the ORR. It is also the document that defines what the ORR will evaluate.

Prior to the Contractor ORR, a Line Management Assessment will be performed to ensure that all procedures are in place, equipment has been procured and is operational, and to validate that the contractor is justified in commencing the ORR process. Subsequent to the Contractor ORR and the WTS declaration of *readiness*, CBFO will perform its own ORR to validate WTS' declaration of readiness. If successful, the WIPP facility will be able to begin RH TRU waste disposal operations from sites who have obtained CBFO certification to ship RH TRU waste.

Breadth of the RH TRU Waste ORR

The Contractor ORR Plan of Action identifies not only the key aspects of operational readiness but also identifies the breadth to which those aspects will be evaluated.

- Responsibility for protection of employees, the public, and the environment
- Lines of authority for responsibility
- Personnel experience, knowledge, skills, and abilities
- Effective allocation of resources
- Hazard identification, evaluation, and mitigation
- Adequate administrative and engineering controls
- Authorization agreements

There are certain conditions must be corrected before RH waste disposal operations can be started. These conditions are called pre-start conditions. During the review, certain pre-start conditions may be

discovered. Resolution of pre-start findings is addressed by a corrective action plan. A pre-start finding demonstrates at least one of the following:

- The inability of essential equipment to perform as specified in design documentation or to operate within specified limitations.
- Conditions, functions, or equipment contrary to those described in the WIPP Safety Analysis Report or Technical Safety Requirement Administrative Controls.
- Potential adverse environmental impact exceeding regulatory or site specific release limits, conditions, or requirements.
- Adverse impact to worker safety and/or health.
- Programmatic noncompliance (e.g., repeated violations of technical procedures associated with waste disposal or supporting process technical procedures or failure to implement authorization basis requirements in technical procedures).
- A lack of adequate technical procedures for a waste disposal or supporting process.
- A lack of specific operator training which adversely affects waste disposal or supporting process performance.

RH TRU Waste ORR Schedule

The current schedule for the WIPP ORR is planned for March 2004 and ending with CBFO's declaration of readiness in November 2005. The process begins with the final development of the Contractor Plan of Action that begins in March 2004 and lasts till July 2005 when DOE approves its Plan of Action. However, the Line Management Assessment (LMA) can commence in September 2004 when DOE has reviewed and approved the LMA affidavits. The LMA is scheduled to end in June 2005.

After the rigorous LMA process is complete and the contractor has justified that it is prepared to begin the Contractor ORR process, it will only take one month to complete the Contractor ORR. The completion date is July 2005. Also, the successful completion of the LMA signals the CBFO that the NMED may inspect the facility for compliance with RH TRU waste permit conditions.

The DOE begins its ORR in March 2005. All pre-start finding will be tracked and closed status validated through the Corrective Actions process. The DOE is scheduled to declared readiness to receive RH TRU waste for disposal from certified generator/storage sites on November 5, 2005.

REFERENCES

- 1 Request for RCRA Class 3 Permit Modification in Accordance with 20.4.1.900 NMAC (incorporating 40 CFR Part 270, Remote-Handled TRU Waste Analysis Plan and Facility Changes, U.S. Department of Energy Carlsbad Field Office, (2002).
- 2 Notification of Planned Change to the EPA 40 CFR 194 Certification the Waste Isolation Pilot Plant; Remote-Handled Transuranic Waste Characterization Plan, U.S. Department of Energy, (2002).
- 3 Letter from the New Mexico Environment Department to the Department of Energy Carlsbad Field

Office and Washington TRU Solutions, LLC; *Notice of Deficiency (NOD) Class 3 Permit Modification Request for Remote Handled TRU Waste, WIPP Hazardous Waste Facility Permit, EPA I.D. Number 4890139088*, dated March 5, 2003.

- 4 Waste Characterization Process Implementation Plan, DOE/WIPP-02-3214, Rev 0, December 2002.
- 5 National TRU Waste Management Plan, DOE-NTP-96-1204, Rev. 3, July 2002.
- 6 Peer Review for High-Level Nuclear Waste Repositories, NUREG 1297, Generic Technical Position, Division of High-Level Nuclear Waste Management, Office of Nuclear Material Safety and Safeguards, US Nuclear Regulatory Commission, February 1988.
- 7 American Society of Mechanical Engineers Nuclear Quality Assurance, ASME NQA-1-1989 edition, ASME NQA-2a-1990 addenda, part 2.7, to ASME NQA-2-1989 edition, and ASME NQA-3-1989 edition (excluding Section 2.1 (b) and (c), and Section 17.1).
- 8 Quality Assurance Program Document, DOE/CBFO 94-1012, U.S. Department of Energy Carlsbad Field Office, Rev. 5, May 2003.
- 9 Peer Review, MP 10.5, Rev.5, Carlsbad Field Office, 2003.
- 10 RH Waste Disposal Operations Contractor Operational Readiness Review Plan of Action, DOE/WIPP DRAFT-3180, Rev 0, 2003.