

## **NRC Perspectives on Waste Incidental to Reprocessing Consultations and Monitoring – 13398**

Christopher A. McKenney, Gregory F. Suber, Harry D. Felsher and Aby Mohseni  
U.S. Nuclear Regulatory Commission  
Mail Stop T8F5  
11545 Rockville Pike, Rockville, MD 20852

### **ABSTRACT**

Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA) requires the U.S. Department of Energy (DOE) to consult with the U.S. Nuclear Regulatory Commission (NRC) for certain non-high level waste (HLW) determinations. The NDAA also requires NRC to monitor DOE's disposal actions related to those determinations to assess compliance with NRC regulations in 10 CFR Part 61, Subpart C. The NDAA applies to DOE activities that will remain within the States of South Carolina and Idaho. DOE has chosen to, under DOE Order 435.1, engage in consultation with NRC for similar activities in the State of Washington and New York, however, the NRC has no monitoring responsibilities. In 2007, the NRC developed a draft Final Report for Interim Use entitled, *NUREG-1854: NRC Staff Guidance for Activities Related to U.S. Department of Energy Waste Determinations*.

Since the law was enacted, the DOE and NRC have consulted on three waste determinations within the affected States: (1) the Saltstone Disposal Facility at the Savannah River Site (SRS) within the State of South Carolina in 2005, (2) the INTEC Tank Farm at the Idaho National Laboratory within the State of Idaho in 2006, and (3) the F Tank Farm at SRS in 2011. After the end of consultation and issuance by DOE of the final waste determination, monitoring began at each of these sites, including the development of monitoring plans. In addition to the NDAA sites, DOE has requested NRC consultation support on both individual tanks and the entire C Tank Farm at the Hanford Nuclear Reservation in the State of Washington. DOE also requested consultation of waste determinations performed on the melter and related feed tanks at the West Valley site in New York that would be disposed offsite.

In the next few years, NRC and DOE will consult on the last of the NDAA waste determinations for a while, the H Tank Farm waste determination at SRS. DOE may identify other activities in the future but largely NRC's role will change from doing both consultation and monitoring to being focused on monitoring activities within NDAA. DOE has identified other activities at the Hanford Nuclear Reservation that would continue consultation activities but outside of the NDAA in the future.

During the past seven years of consultations and monitoring a number of lessons learned about the process, communication issues, and technical guidance have been identified. With the change in focus from reviewing initial performance assessments and draft waste determinations to long-term monitoring (e.g., individual waste tank closure, at F Tank Farm or complete tank farm closure at INTEC expected in the near future), the NRC is going to revise and update its guidance over the next few years to reflect the lessons learned and the change in focus. In addition to the lessons learned, improvements in the guidance will have to account possible rule and guidance changes underway within Part 61. This paper will discuss the initial plans, approaches, and time lines to revise the guidance within NUREG-1854, including opportunities for public involvement.

## INTRODUCTION

The concept of incidental waste, also known as waste-incident-to-reprocessing (WIR), is that some wastes can be managed based on their risk to human health and the environment, rather than based on the origin of the wastes. For wastes resulting from reprocessing of spent nuclear fuel, some of the waste is highly radioactive and needs to be treated and disposed of as HLW in a geologic repository, while other parts of the waste (including the equipment contaminated by the reprocessing waste) do not have the same characteristics. Incidental waste does not pose the same amount of risk to human health and the environment and disposal options may be designed to manage its disposal in the near-surface.

DOE which has the responsibility for managing the reprocessing wastes currently present in the United States uses technical analyses to support a risk-informed decision, called a “waste determination,” to evaluate whether waste is incidental or HLW, consistent with its DOE Order 435.1, “Radioactive Waste Management” [1]. A waste determination is DOE’s analysis as to whether the waste will meet the applicable incidental waste criteria and usually includes a performance assessment. A performance assessment is a quantitative evaluation of long-term potential releases of radioactive material into the environment and the resultant radiological doses, and evaluates changes in the system behavior over time.

The concept of incidental waste has been recognized since 1969 when the Atomic Energy Commission (AEC) issued for comment a draft policy statement regarding the siting of reprocessing facilities in the form of a proposed Appendix D to 10 CFR Part 50, which addressed a definition of HLW [2]. In the final rule, the concept was removed from the Appendix (now F), because the AEC wanted to preserve its flexibility as to how such material should be treated. In 1993 and again in 2000, NRC published general technical criteria on determining when waste was incidental to reprocessing and not HLW [3, 4].

During the late 1990s and early 2000s, DOE requested the NRC to perform independent technical reviews of four draft waste determinations using the general technical criteria. NRC performed its review and provided technical evaluation reports and recommendations to DOE for its consideration in the final waste determinations. At this stage, this consultation activity was the extent of NRC’s involvement in DOE waste determinations.

In October 2004, NDAA was enacted. Section 3116 of the NDAA allows DOE to continue to use an incidental waste process to determine that waste is not HLW, similar to the process already in use under DOE 435.1, but limited to actions in the State of South Carolina and Idaho. In addition to the development of the draft waste determination, and subsequent, independent technical evaluation by the NRC, that was already in DOE Order 435.1, the NDAA added that NRC, in coordination with the State, monitor disposal actions DOE takes to assess compliance with NRC regulations in 10 CFR Part 61, Subpart C. As the NDAA did not address the States of Washington or New York, waste determinations in those States could continue to be made consistent with DOE Order 435.1, including any consultation with NRC during the draft stage, but NRC would not have any monitoring responsibilities.

Since the NDAA was enacted, the DOE and NRC have consulted on three draft waste determinations: (1) the Savannah River Site's Saltstone Disposal Project, (2) the Idaho National Laboratory's Tank Farm, and (3) the Savannah River Site's F Tank Farm [5, 6, 7]. DOE considered the results of NRC's consultation and made final waste determinations in January 2006, November 2006, and March 2012, respectively. After the issuance of the final waste determination by DOE, NRC's monitoring responsibilities began. As part of the monitoring process, NRC developed site-specific monitoring plans based on the key aspects of the disposal action that would drive site performance. As new information is gained and design aspects change with time, monitoring plans are revised to continue to focus on the key aspects of the disposal action.

In addition, in August 2007, NRC published "NUREG-1854, NRC Staff Guidance for Activities Related to U.S. Department of Energy Waste Determinations." [8]. NUREG-1854 guides staff reviews of the technical analyses of DOE waste determinations, as part of both the consultation and monitoring phases. The document was based on staff experience in both consultations prior to the NDAA as well as experience in addressing the first two draft waste determinations under the NDAA.

## **GUIDANCE REVISIONS**

In early 2013, NRC is expecting to receive the last draft waste determination from DOE, under the NDAA, for the foreseeable future. This draft waste determination is focused at the closure of the H Tank Farm at the Savannah River Site. The consultation is expected to be finished in Fiscal Year 2014,(FY) at which point, under the NDAA, NRC will be focused at monitoring the disposal actions for each of NDAA waste determinations. In addition, NRC will have two full NDAA consultations completed and several years of monitoring using the staff guidance in NUREG-1854. Based on lessons learned from this experience, the staff can improve the guidance in NUREG-1854 to increase the efficiencies of technical reviews, transparency to our stakeholders, and clarity to decision makers.

NRC plans to revise its guidance over the next several years, as resources allow. Although consultation on H Tank Farm and monitoring of all the sites will continue to be first priority for resources, but, NRC intends to start evaluating areas for improvement in FY 2013. Currently, NRC is also involved in revising its rule on land disposal of radioactive waste that will influence the timing of exact changes and issuance of a revised draft NUREG-1854 for public comment [9].

The first section of the guidance the staff will focus on is Chapter 10, "NDAA Compliance Monitoring," of NUREG-1854. As the monitoring of DOE waste determinations was a new responsibility provided to NRC with the NDAA, this section of the guidance was written on a fairly general level, assuming that more detail and direction could be provided in the site-specific monitoring plans. NRC now has several years exercising the guidance in Chapter 10 and can expand the relevant guidance. As monitoring will be the primary focus in the next few years, expanding and improving this guidance was given higher priority over other modifications. After revisions are made, the staff will issue the revised Chapter as interim staff guidance for public comment, rather than reissuing the entire NUREG-1854. This is consistent with the NRC

approach for other large guidance documents to be able to provide revisions on a timely basis.

As this task will start in later FY 2013, early indications are that changes will occur to most sections of this Chapter to align with NRC practice, process improvements, lessons learned, and foreseeable needs. For example, Section 10.2 on coordinating with the covered State will be expanded to provide clarity and guidance for staff on both regular communications with the State as well as processes for finalizing documents. As an example of a change due to foreseeable needs, at the Idaho National Laboratory in the next few years, all the tanks will be closed and grouted. At that point, no significant actions will be taking place for several years until DOE decisions are made about any potential engineered covers over the site. Currently, monitoring activities for both Idaho and Savannah River are managed out of NRC headquarters as our monitoring activities are a combination of site observations, data gathering and technical discussions related to key aspects of the performance assessments. At Idaho, in a few years, or Savannah River Site, after key technical issues that headquarters staff is involved with are addressed, it may be possible to transfer some of the monitoring responsibilities to the NRC regions to allow efficiencies because of co-located NRC-licensed activities. NRC inspection staff could visit the sites, as necessary, during an inspection to a nearby NRC-licensed activity with little additional cost, while continuing to insure that NRC is receiving the appropriate information to fulfill its monitoring responsibilities.

The majority of the rest of the guidance is on performing the technical analyses to identify the key aspects of performance. While this guidance is specific to waste determinations, many of the concepts and issues are similar to those for other performance assessments of low-level waste and decommissioning. Currently, NRC is developing a proposed rule to make changes to 10 CFR Part 61. Along with the proposed changes in the rule language, guidance will be provided on meeting these new requirements. Thus, the changes from this rulemaking may impact the staff guidance on waste determinations. Therefore, in FY 2014, the staff will start scoping changes to the technical chapters of NUREG-1854 accounting for lessons learned from consultations and monitoring, and relevant national and international guidance. The staff will develop new draft NUREG-1854 during FY 2015 and 2016, with the intent to issue it for comment in FY 2016 to allow for completion of the 10 CFR Part 61 rulemaking.

## **STAKEHOLDER PARTICIPATION OPPORTUNITIES**

The process will allow several opportunities for stakeholder participation in commenting on the scope and draft documents. A schedule of activities and available documents will be placed on the Waste Incidental to Reprocessing (WIR) page on NRC's public website ([www.nrc.gov](http://www.nrc.gov)). Individual meetings will be announced on our public meeting calendar along with our service lists. The revised draft NUREG-1854 will be issued for comment; however, prior to that, there will be additional opportunities for stakeholder involvement. On nearly an annual basis, NRC and DOE hold "Lessons Learned" meetings on WIR activities. The next meeting will be held in early summer 2013 near Washington, DC and will have webcasting for additional participation. At this meeting, we will discuss our expected changes to Chapter 10 of the NUREG in more detail. The next year, before we are done with staff scoping of the potential changes to the rest of the document, we will hold another public meeting to discuss both the revised Chapter 10 and

the potential changes to the rest of the guidance document. In FY 2016, after publication of the revised draft NUREG-1854 for comment, we will hold another public meeting to gather comments on the document.

## CONCLUSION

After several years of monitoring and completing all of the major waste determinations under the NDAA, NRC is in the process of revising its staff guidance to align with the lessons learned, potential changes in 10 CFR Part 61 requirements affecting waste determinations, and current approaches in both national and international performance assessments for near-surface disposal. Activities will start during the early summer of 2013 with a joint NRC/DOE public meeting on “Lessons Learned.” Staff will focus their first efforts on revising Chapter 10 “NDAA Compliance Monitoring.” Efforts to revise the technical guidance will parallel guidance being developed for potential changes to 10 CFR Part 61. A new revised draft NUREG-1854 for public comment will be issued in FY 2016. Several opportunities for stakeholder involvement will occur during the entire process.

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