BRIEFING PAPER ON THE NRC RULEMAKING FOR 10 CFR Part 61

JUNE 2012

Background

The development of 10 CFR Part 61 regulations in the early 1980s was based on several assumptions about the types of wastes that were likely to go into a low-level waste site. The Draft Environmental Impact Statement (DEIS) considered 37 distinct commercial waste streams and 25 radionuclides of potential interest. The specific waste streams in question were representative of the types of commercial LLW being generated at the time. The waste streams from the U.S. Department of Energy (DOE) were not considered as part of the survey, because disposal of those wastes was to be done at the DOE-operated sites. Over the last several years there have been a number of developments that have called into question some of the key assumptions made in the DEIS, including:

- The emergence of new LLW streams that were not considered in the original rulemaking, including large quantities of depleted uranium (DU).
- The possible inclusion of wastes associated with the commercial reprocessing of spent nuclear fuel.
- DOE's increasing use of commercial facilities for the disposal of defense-related LLW streams.
- Extensive international operational experience in the management of LLW and intermediate-level radioactive wastes.

Recent Commission Direction to the NRC Staff

In March 2009, the Commission directed the NRC staff to proceed with a 10 CFR Part 61 rulemaking to identify requirements for:

- A site-specific analysis for the disposal of large quantities of DU.
- Outlining technical requirements for such an analysis.
- Developing a guidance document for public comment that explains the parameters and assumptions to be used.
- Including blended LLW streams in the rulemaking.

Following public input in 2009, NRC staff next developed a technical basis document for the rulemaking amendment, shared it with the NRC Agreement States, and proceeded to develop a proposed rulemaking package. In connection with the rulemaking effort, NRC staff also proposed a two-tiered approach for evaluating compliance with 10 CFR Part 61's:

- Overall system performance to 20,000 years.
- Long-term assessment that extends beyond 20,000 years to the time of peak dose.

In May 2011, NRC staff sought public feedback on the preliminary proposed rulemaking language as well as the technical basis for the time of compliance. Later in 2011, the staff also

briefed the Advisory Committee on Reactor Safeguards (ACRS) on the preliminary proposed rulemaking.

In 2012, the Commission provided additional direction to the NRC staff concerning the rulemaking. Specifically, the NRC staff was directed to amend the existing draft rulemaking to include the following:

- Allow licensees the flexibility to use ICRP dose methodologies in a site-specific performance assessment for the disposal of all radioactive waste.
- Use a two-tiered approach that covers the reasonably foreseeable future and a longer period of performance that is not *a priori* and is established to longer timeframes.
- Base the performance period on the site-specific characteristics (waste package, waste form, disposal technology, cover technology and geohydrology).
- Allow for flexibility for the disposal facilities to establish site-specific waste acceptance criteria based on the results of the site's performance assessment and intruder assessment.
- Establish a compatibility category for the revised rule that sets up the requirements for site-specific performance assessments, and the development of the site-specific waste acceptance criteria that ensure alignment between the States and Federal government on safety fundamentals, while providing the States with the flexibility.

Other similar 10 CFR Part 61 NRC Activities

NRC staff has also conducted other actions related to 10 CFR Part 61. These include revisions to:

- The Commission's *LLW Volume Reduction Policy Statement*.
- The *Concentration Averaging Branch Technical Position Paper*.

The NRC received comments and suggestions for a more comprehensive revision of 10 CFR Part 61. For example, stakeholders recommended changes to the period of institutional controls and the use of a site-specific intruder assessment. Some stakeholders have questioned the basic foundation of Part 61, including the need to protect the inadvertent intruder.

September 2009 Public Workshop on Part 61 Rulemaking: Summary

<u>Initial Rulemaking:</u>

- Require site-specific analysis.
- Meet performance objectives.
- Specify criteria needed for analysis.
- Develop supporting guidance.

<u>Long-Term Rulemaking:</u>

- Risk-inform waste classification framework.
- Change conforming legislation as needed.
- Evaluate and revise waste classification tables.

Public Comments Included:

- The period of performance should be specified in rule language with other criteria, such as exposure scenarios, specified in guidance.
- Not to define the term "significant quantity" of depleted uranium in the regulation, as the performance assessment would determine the amount of waste appropriate for disposal.
- General agreement not to define the term "unique waste streams" during the initial rulemaking.

October 2009 Public Workshop on Part 61 Rulemaking: Summary

Public Comments Included:

- The need for interim guidance to be issued by the NRC for use by disposal facility operators and Agreement State regulators during the period before the rulemaking becomes final.
- There should be a requirement, specified in the rule, to perform and update the disposal facility's performance assessment on a periodic basis.
- Changes to other sections of 10 CFR Part 61 may be necessary (e.g., the performance objectives to specify the inadvertent intruder dose limit).

March 2012 Part 61 Rulemaking Public Meeting (Phoenix): Feedback

Public Comments Included:

- Stakeholders support allowing licensees the flexibility to use ICRP dose methodologies in a site-specific performance assessment for the disposal of radioactive waste.
    - Stakeholder feedback was mixed concerning time of compliance (TOC) duration (first tier) for 1,000 years.
    - Some stakeholders support TOC duration for 10,000 years.
    - Some stakeholders support TOC duration for an intermediate number between 1,000 and 10,000 years.
- Consider other performance metrics for the second tier.
- Stakeholders support allowing licensees the flexibility to establish site-specific waste acceptance criteria based on the results of the site's performance assessment and intruder assessment.
- Stakeholder support was mixed on compatibility.
- Concern was expressed that compatibility designation should be neutral and not create opportunities for unfair competitive advantage.

Emerging Technical Issues Public Meetings:

- The protection concept for the inadvertent intruder is flawed.
- The assumption that intrusion will occur is not risk-informed (current probability of 1).
- The need to protect future generations is over-emphasized.
- The current 100-year institutional control period is too short.
- Financial assurance requirements for some states preclude loss of control.
- The GTCC disposition issue needs to be factored into any broader discussions concerning revisions to Part 61 now that work at Yucca Mountain, has been essentially terminated.

- There is a need for a new environmental impact statement, as the initial assumptions are outdated.
- Engineered barrier system—specify performance criteria (or some minimum level of performance).
- Part 61 needs to be amended to include criteria for the management of LLW that is very short-lived and amendable to disposal in municipal waste facilities.
- Definitions and concepts:
    - "Reasonably foreseeable" is not understood or well-defined.
    - "*De minimus*" or clearance levels should be established.
    - Separate disposal requirements and criteria should be established for depleted uranium, distinct from classic "LLW".
    - Compatibility category for 10 CFR Part 61.58 should be changed to "B" from "D".
    - Changes should be restricted to new sites (grandfather current sites).
    - Eliminate the 10 CFR Part 61.55 waste classification tables.
    - Explicitly account for uranium and daughter products in waste classification tables.
    - Update tables to reflect latest ICRP dosimetry.
    - Expand classification tables to include a more comprehensive suite of isotopes.
- Update waste classification tables to reflect latest ICRP dosimetry:
    - The regulation needs to rely on current science.
- Extend the duration of institutional controls:
    - The current 100-year duration appears to be arbitrary.
- It is recommended to amend Part 20, Appendix G, LLW Manifest Reporting Requirements:
    - Certain isotopes are currently over-reported, owing to minimum detection thresholds.
    - Over-reporting artificially inflates actual disposal site inventory.