2015 RADWASTE SUMMIT
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NRC Update of Low Level Waste Emerging Issues

September 10, 2015
ANNUAL RADWASTE SUMMIT
Summerlin, NV
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Office of Nuclear Material Safety and Safeguards
Objective

To discuss the overall Low Level Waste (LLW) Program with a focus on the Part 61 Rulemaking, Greater-than-Class C (GTCC) Waste Disposal, and the Low-Activity Waste Scoping Study
LLW Program Overview

- Part 61 Rulemaking
- Transuranic Waste
- GTCC Waste
- Waste Incidental to Reprocessing
- Uniform Waste Manifest
- Programmatic Assessment
- Next Part 61 Rulemaking?
- CA BTP Implementation
- International
- Byproduct Material Financial Scoping Study

International Waste Incidental to Reprocessing

3
10 CFR Part 61 LLW Disposal Rulemaking
Why Are We Doing This Rulemaking?

Require LLW disposal licensees or license applicants to ensure that LLW streams that are significantly different from the LLW streams considered in the current 10 CFR Part 61 regulatory basis can be disposed of safely.
Rationale for Current Rulemaking

- Depleted uranium (especially from enrichment facilities)
- LLW from U.S. Department of Energy’s operations
- Waste forms/volumes
- Blended LLW (greater quantities than previously expected)
- New technologies might generate unexpected LLW waste streams
Major Changes in the Proposed Rule (10 CFR Part 61)

• 1,000 year compliance period
• Inadvertent Intruder analysis
• Protective Assurance analysis
• Long-lived LLW analysis for performance period beyond 10,000
Major Changes in the Proposed Rule (10 CFR Part 61) (cont’d)

• **Safety Case/Defense in depth**
• **Updated technical analyses at closure**
• **Site Specific Waste Acceptance Criteria**

Performance Period:
- Minimize to extent reasonable achievable
- Minimize to extent reasonable achievable

Protective Assurance Period:
- Minimize to 500 mrem/yr target or other
- Minimize to 500 mrem/yr target or other

Compliance Period:
- 25 mrem/yr dose limit, ALARA
- 500 mrem/yr dose limit

Protection of general population (10 CFR 61.41)
Protection of inadvertent intruder (10 CFR 61.42)

Site Closure

Increasing uncertainty, flexibility to licensees and decision makers

SRM-SECY-13-0075
3-tier approach

1 Only applicable if concentrations on a facility-averaged basis are above 10 CFR 61.13(e) Table A
Comments Received

- Concerns with using current ICRP methodology and some concerns about what that might imply.
- Others agreed with proposal to use latest ICRP methodology.
- Concerns with Compatibility B designation for major portions of the proposed rule.
- Long term siting stability was brought up as a concern.
- There was a lot of discussion about what we're changing on the intruder dose and some of the assumptions that go into the intruder dose.
• The phantom four (C-14, Tc-99, I-129, & H-3) were raised as a concern. They are long-lived isotopes, and they're very mobile, but they are hard to measure.
• Some favored second rulemaking on waste classification, others thought it was unnecessary.
• Applicability of the new requirements to the existing sites was raised as a concern.
• Some thought the proposed rule was too and complex. They suggested moving more information to the guidance document.
Comments Received (cont’d)

- Some thought a supplemental environmental impact statement was needed.
- Transparency and availability of performance assessments was questioned.
- Staff needs to do a cost benefit analysis to prove the changes will be worth the costs.
Next Steps

• Comment period ended on July 24, 2015
• Comment period reopened to address extension requests received
• Reopened comment period expires September 21, 2015
• Final rule to be sent to Commission May 2016
• Recommendation to Commission on need for second rulemaking on waste classification
Legislative History

- Atomic Energy Act of 1954 (AEA)
- Amendments Act of 1985
10 CFR § 61.55(a)(2)(iv)

- More stringent methods
- Preference for Part 60 or 63 geologic disposal
- Commission approves alternative
LLW and Transuranic Waste

- Class A
- Class B
- Class C
- GTCC

LLW

Transuranic Waste
What is LLW?

1980 LLRW Policy Act

“radioactive waste not classified as high-level radioactive waste, *transuranic waste*, spent nuclear fuel, or byproduct material...”
What is LLW? (cont’d)

10 CFR Part 61

• *Purpose and scope* does not exclude transuranic waste but *definition* does

• Table 1 includes concentrations for transuranic nuclides
What is LLW? (cont’d)

Amendments Act

“radioactive material that: (i) is not high-level radioactive waste, spent nuclear fuel, or byproduct material…and (ii) the [NRC]...classifies as [LLRW]”
What is Transuranic Waste?

Price-Anderson Amendments Act

“material contaminated with elements that have an atomic number > 92...concentrations > 10 [nCi/gm], or...as the [NRC] may prescribe”
Transuranic Nuclides Disposal

Alpha emitting transuranic nuclides with half-lives greater than 5 years and a concentration less than 100 nCi/gm

<table>
<thead>
<tr>
<th>Radionuclide</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-14</td>
<td>8 Ci/m³</td>
</tr>
<tr>
<td>C-14 in activated metal</td>
<td>80 Ci/m³</td>
</tr>
<tr>
<td>Ni-59 in activated metal</td>
<td>220 Ci/m³</td>
</tr>
<tr>
<td>Nb-94 in activated metal</td>
<td>0.20 Ci/m³</td>
</tr>
<tr>
<td>Te-99</td>
<td>3 Ci/m³</td>
</tr>
<tr>
<td>I-129</td>
<td>0.08 Ci/m³</td>
</tr>
<tr>
<td>Alpha emitting transuranic nuclides with half-lives greater than 5 years¹</td>
<td>100 nCi/g</td>
</tr>
<tr>
<td>Pu-241</td>
<td>3,500 nCi/g</td>
</tr>
<tr>
<td>Cm-242</td>
<td>20,000 nCi/g</td>
</tr>
</tbody>
</table>

¹.: According to 10 CFR 61.55.
Option 1: NRC License

• NRC conducts the following:
  – License application review
  – Site-specific technical requirement development
  – EIS preparation
  – Rulemaking
Option 2: Texas License

- Texas submits proposal for the Commission consideration
- Texas develops technical criteria (assisted by NRC)
- NRC conducts rulemaking
Option 3: No-Action

- Commission declines to extend the licensing scheme to allow near-surface disposal of GTCC and transuranic waste
- Industry continues to rely on safe storage of GTCC and transuranic waste
Staff Recommendation

• Option 2 with rulemaking
• Establishes clear-cut Federal and State licensing pathways for disposal of GTCC and transuranic waste
• Offers additional efficiency
LAW Scoping Study
LAW Scoping Study Overview


• 2007 NRC LLW Strategic Assessment had three items related to LAW
  – Coordinate with other agencies on consistency in regulating LAW disposal.
  – Develop guidance that summarizes disposition options for low-end materials and waste.
  – Promulgate rule for disposal of LAW.
2015 Assessment combined them into one medium priority LAW scoping study

- Coordinate with other agencies
- Develop consistent approach for regulating LAW
- Determine the impact of LAW disposal from radiological dispersal devices
- Develop regulatory options that would define the conditions under which LAW, including mixed waste, could be disposed of in RCRA Subtitle C hazardous waste facilities
LAW Scoping Study Methodology

- Study will consider the divergent stakeholder comments as part of the programmatic assessment

- Lessons learned from the revoked below regulatory concern policy statements of the NRC published in the *Federal Register* on July 3, 1990 (55 FR 27522), and August 29, 1986 (51 FR 30839)

- Lessons learned from the Commission’s 2005 disapproval of publication of a proposed rule (the "Clearance" rule)

- Learning from other countries with LAW disposal
LAW Scoping Study Possible Results

- Rulemaking
- Update guidance
- Further analysis may be needed
- No action taken
NRC LLW Program Summary

- Proposed 10 CFR Part 61 Rulemaking
- Another Part 61 Rulemaking?
- GTCC Rulemaking
- LAW Scoping Study
  * Byproduct Material Financial Scoping Study
Questions?
Backup Slides
NRC Staff Byproduct Material Financial Scoping Study
Crux of the Issue

• Threshold for financial assurance requirements in 10 CFR 30.35 for decommissioning Radioactive Sealed Sources (RSS) is higher than most Category 1 and 2 sources
• Therefore, there is no standing requirement for decommissioning financial assurance for many of these sources
• Financial burden for decommissioning/disposal can be consequential
• Issue was identified in 2006 Radiation Source Protection and Security Task Force Report
Recent Background

• Current focus arose from Commission briefing on Radioactive Waste Issues on September 18, 2014
• Staff stressed timeliness of completing a Byproduct Material Financial Scoping Study identified in 2007 LLW Strategic Assessment citing:
  – March 2014 Report by LLW Forum Disused Sources Working Group
• Resulting Staff Requirements Memorandum September 24, 2014
  – “provide results of the byproduct financial scoping study and recommendations for next steps”
Current Status

- **Federal Register Notice (August 3, 2015; FR Doc #2015-18891)**
  - define the issue
  - solicit perspective from stakeholders
- Upcoming public meeting (Fall 2015)
- Presentations at stakeholder meetings
- Feedback used to prepare recommendations to Commission by Spring 2016
Safety (Part 30) vs. Security (Part 37) issue

Is there a problem/deficiency not addressed by
  - Part 37 requirements
  - License requirements
  - Enforcement

If so, is byproduct financial planning the best solution...a workable solution

If so, what is the best implementation strategy
NRC UPDATE ON LOW LEVEL WASTE REGULATORY INITIATIVES

Moderator: Jeremy Dillon, Reporter, RadWaste Monitor, Exchange Monitor

Speakers:
- Larry Camper, Director, Division of Waste Management and Environmental Protection, US Nuclear Regulatory Commission