NRC LED PANEL DISCUSSION ON THE PROPOSED LOW-LEVEL RADIOACTIVE WASTE DISPOSAL RULEMAKING

Chip Cameron, Facilitator

April 28, 2015
NRC Public Meeting
Rockville, MD

U.S.NRC
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Agenda

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9:30 - 9:40	Facilitator opening comments and introductions	C. Cameron
9:40 - 9:45	NRC Welcome	L. Camper, NRC/NMSS[1]
9:45 - 10:00	Discussion of rulemaking process and comment process	G. Comfort, NMSS
10:00 – 11:30	NRC presentations, panel discussions, questions and comments from public	D. Esh, NMSS and C. Grossman, NMSS
11:30 - 12:30	Break	
12:30 - 3:20	NRC presentations, panel discussions, questions and comments from public	D. Esh, NMSS and C. Grossman, NMSS
3:20 – 3:30	Closing comments	C. Cameron and L. Camper

[1]NRC's Office of Nuclear Material Safety and Safeguards

NRC LED PANEL DISCUSSION ON THE PROPOSED LOW-LEVEL RADIOACTIVE WASTE DISPOSAL RULEMAKING

Larry W. Camper, CEP,REP, CIPM

Director

Division Of Decommissioning, Uranium Recovery, and Waste Programs

Office of Nuclear Material Safety and Safeguards

April 28, 2015
NRC Public Meeting
Rockville, MD

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Objective

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To discuss the proposed revisions to the Commission's low-level radioactive waste disposal regulations, encourage the submittal of comments on the proposed rule language, and answer questions and receive comments from the public.

Why are we doing this rulemaking?

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Require low-level radioactive waste (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.

CLI-05-20 Memorandum and Order (2005)

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The Commission is aware that in creating the § 61.55 waste classification tables, the NRC considered depleted uranium, but apparently examined only specific kinds of depleted uranium waste streams – "the types of uranium-bearing waste being typically disposed of by NRC licensees" at the time. The NRC concluded that those waste streams posed an insufficient hazard to warrant establishing a concentration limit for depleted uranium in the waste classification tables. Perhaps the same conclusion would have been drawn had the Part 61 rulemaking explicitly analyzed the uranium enrichment waste stream.

Continued on next page →

CLI-05-20 Memorandum and Order (2005)

But as Part 61's FEIS indicates, no such analysis was done. Therefore, the Commission directs the NRC staff, outside of this adjudication, to consider whether the quantities of depleted uranium at issue in the waste stream from uranium enrichment facilities warrant amending section 61.55(a)(6) or the section 61.55(a) waste classification tables.

Commission Direction: SRM-SECY-08-0147 (2009)

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Previously, in the adjudicatory proceeding for the Louisiana Enrichment Services (LES) license application, the Commission determined that depleted uranium is properly classified as low-level radioactive waste. Although the Commission stated that a literal reading of 10 CFR 61.55(a)(6) would render depleted uranium a Class A waste, it recognized that the analysis supporting this section did not address the disposal of large quantities of depleted uranium. Outside of the adjudication, the staff was tasked to evaluate this complex issue and provide specific recommendations to the Commission.

Commission Direction: SRM-SECY-08-0147 (2009)

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Two tasks:

- Specify a requirement for a site-specific analysis, technical parameters (i.e., new definitions and performance period) to support such analysis, and develop a guidance document.
- "…in a future budget request, the staff should propose the necessary resources for a comprehensive revision to risk-inform the Part 61 waste classification framework, with conforming changes to the regulations as needed, using updated assumptions and referencing the latest ICRP methodology…" "…This effort should explicitly address the waste classification of depleted uranium…"

Commission Redirection: SRM-COMWDM-11-0002 /COMGEA-11-0002 (2012)

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- Flexibility to use current International Commission on Radiological Protection (ICRP) dose methodologies
- Two-tiered period of performance:
  - Tier 1: Compliance period covering reasonably foreseeable future
  - Tier 2: Longer period based on site characteristics and peak dose to a designated receptor, that is not a priori
- Flexibility to establish site-specific waste acceptance criteria based on performance and intruder assessments
- Balance Federal-State alignment and flexibility

SRM-COMWDM-11-0002 /COMGEA-11-0002 (2012)

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The changes considered as part of the current rulemaking should be limited to revisions to address the four issues identified. The staff should, separate from any actions resulting from this SRM, continue to engage stakeholders to pursue the possibility of the other risk-informed revisions to 10 CFR Part 61 outlined in SECY-10-0165. *Continued on next page*

SRM-COMWDM-11-0002/ COMGEA-11-0002 (2012)

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Recognizing that the path forward on revisions on the issues outlined in SECY-10-0165 depend in part on the final content of the limited rulemaking, the notation vote paper providing the staff's recommendations on which, if any, of the risk-informed revisions in SECY-10-0165 should be implemented should be submitted to the Commission after completion of the limited rulemaking.

SRM-13-0001 (2013)

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The staff should end further efforts associated with SECY-10-0165, "Staff's Approach to Comprehensive Revision to 10 CFR Part 61," and proceed with the integrated approach to revising 10 CFR Part 61 as described in SECY-13-0001.

Continued on next page →

SRM-13-0001 (2013)

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After the limited rulemaking is complete, the staff should provide a CA note to the Commission on the second rulemaking effort for the waste classification tables. The CA note should outline the objectives and timeline for developing the regulatory basis of this second rulemaking, in consideration of the outcome of the near-term limited rulemaking that will precede it. The CA note to the Commission should identify the specific comments that have been received on the need for a second rulemaking, and clearly articulate the basis in accepting or dismissing their comments.

Commission Direction: SRM-SECY-13-0075 (2014)

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- The proposed rule should be published with a compatibility category "B" applied to the most significant provisions of the revised rule, including the Compliance Period, the Protective Assurance Period and its analytical threshold, and the Waste Acceptance Criteria.
- Realistic intruder scenarios based on expected activities on and around the disposal site at the time of closure
- Licensing decisions are to be based on defense-in-depth (DID) protections (e.g. siting, waste forms) and performance assessment (PA) goals/insights.
  - This combination of DID and PA is the safety case for licensing.
- Thorough review of guidance by LLW community

Purpose and Scope Provisions in Current Rule (10 CFR 61.1(a))

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The regulations in this part establish, for land disposal of radioactive waste, the procedures, criteria, and terms and conditions upon which the Commission issues licenses for the disposal of radioactive wastes containing byproduct, source and special nuclear material received from other persons. Disposal of waste by an individual licensee is set forth in part 20 of this chapter. Applicability of the requirements in this part to Commission licenses for waste disposal facilities in effect on the effective date of this rule will be determined on a case-by-case basis and implemented through terms and conditions of the license or by orders issued by the Commission.

Federal Register Notice - Proposed Rule for Public Comment

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B. Who would this action affect?

This proposed rule would affect existing and future LLRW disposal facilities that are regulated by the NRC or an Agreement State.

Rationale for Current Rulemaking

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-Depleted uranium(especially from enrichment facilities)

-LLW from DOE operations

-Waste forms/volumes

-Blended LLW(greater quantities than previously expected)

-New technologies might generate unexpected LLW waste streams

Schedule/Location for Future Meetings

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May 12, 2015 – Austin, TX

June 2, 2015 – Columbia, SC

June 9, 2015 – Richland, WA

June 10, 2015 – Salt Lake City, UT

Meetings will be held 6 – 9 pm, specific locations are TBD

10 CFR Part 61 Rulemaking Process and Comment Submittal

Gary Comfort, Senior Project Manager

Division of Material Safety, State, Tribal, and Rulemaking Programs

Office of Nuclear Material Safety and Safeguards

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Part 61

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- Why Rulemaking?
- Timeline
- Comment Submittal
- Guidance

Why Rulemaking?

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- Implement Commission policy
- Make provisions generally applicable
- Public process
- Address lessons learned
- Address various recommendations

Part 61 - Timeline

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- Published for comment March 26, 2015
- Accepting comments through July 24, 2015
- Final rule to Commission – approximately 12 months after comment period closes
- Rule effective 1 year after final rule published
- Agreement States - 3 years to develop compatible regulations

What is the Path Forward?

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Rulemaking

- **March 2015**: Public Meetings and Comments
- **August 2015**: Develop Responses to Comments and Final Rule
- **August 2016**: Publish Final Rule
- **August 2017**: Rule Becomes Effective
- **August 2020**: Agreement States Issue Rules

Guidance

- **August 2015**: Develop Responses to Comments and Final NUREG-2175
- **August 2016**: Publish Final Guidance

Note: Dates are approximate

How Can I Submit Comments?

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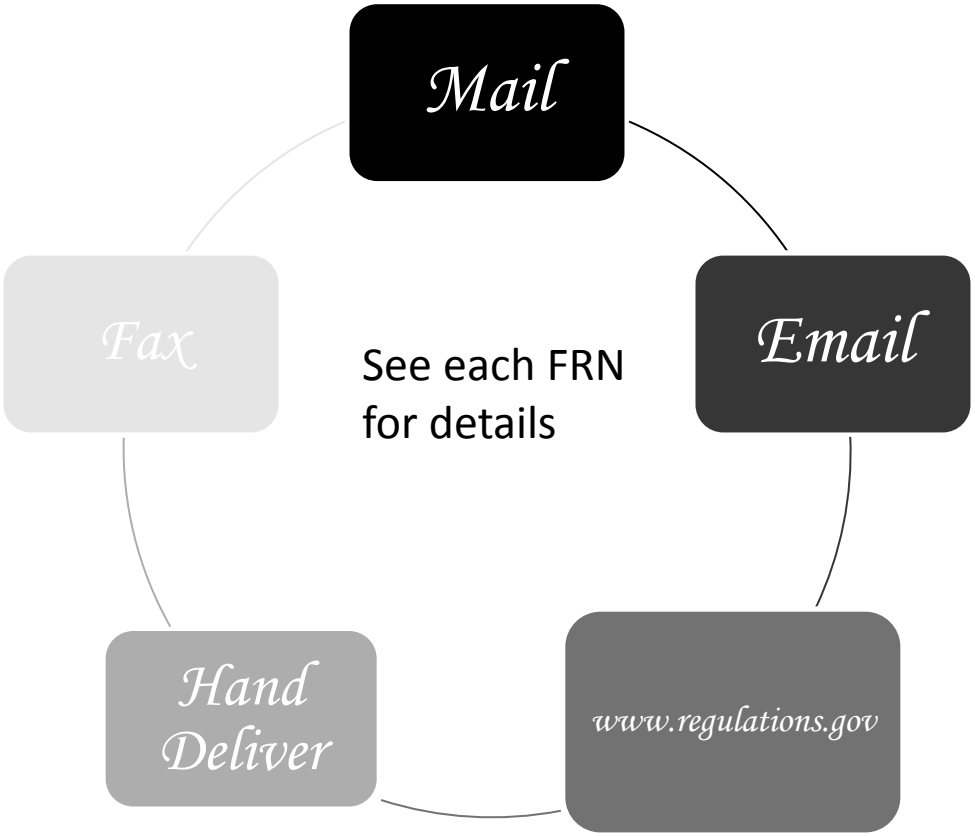

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Comment Submittal: Proposed Rule – Low-Level Radioactive Waste Disposal

- Please include Docket ID NRC-2011-0012 in the subject line of your comments.
- **Federal Rulemaking Website:** Go to http://www.regulations.gov and search for documents filed under Docket ID NRC-2011-0012.
- **Mail comments to:** Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.
- **E-mail comments to:** Rulemaking.Comments@nrc.gov. If you do not receive a reply e-mail confirming that we have received your comments, contact us directly at 301-415-1677.
- **Hand-deliver comments to:** 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 am and 4:15 pm Federal workdays. (Telephone 301-415-1677)
- **Fax comments to:** Secretary, U.S. Nuclear Regulatory Commission at 301-415-1101.

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Part 61 Guidance

Draft NUREG – 2175,
"Guidance for Conducting Technical Analyses for 10 CFR Part 61"

- Draft implementation guidance has also been issued for public comment
  - Can be found in ADAMS at ML15056A516
  - Comments due July 24, 2015
  - Final implementation guidance to be published with final rule

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Comment Submittal Implementation Guidance for 10 CFR Part 61

- Please include Docket ID NRC-2015-0003 in the subject line of your comments.
- **Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for documents filed under Docket ID NRC-2015-0003. Click on the comment icon and complete the Web form.
- **Mail comments to:** Cindy Bladey, Chief, Rules, Announcements, and Directives Branch (RADB), Office of Administration, Mail Stop: 3WFN-06-A44M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

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Questions?

Gary Comfort
gary.comfort@nrc.gov
(301) 415-8106

Overview of Proposed 10 CFR Part 61 Technical Requirements and Guidance

David Esh and Christopher Grossman
Division of Decommissioning, Uranium Recovery, & Waste Programs
Office of Nuclear Material Safety and Safeguards

April 28, 2015 NRC Public Meeting, Rockville MD

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Overview

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- Rule Topics
  - Analyses timeframes
  - Performance assessment (PA)
  - Intruder assessment (IA)
  - Protective assurance period analyses
  - Performance period analyses
  - Safety case / Defense-in-depth (DID)
  - Waste acceptance criteria (WAC)
  - Other

- Guidance
  - Overview
  - Select examples

Context for Analyses

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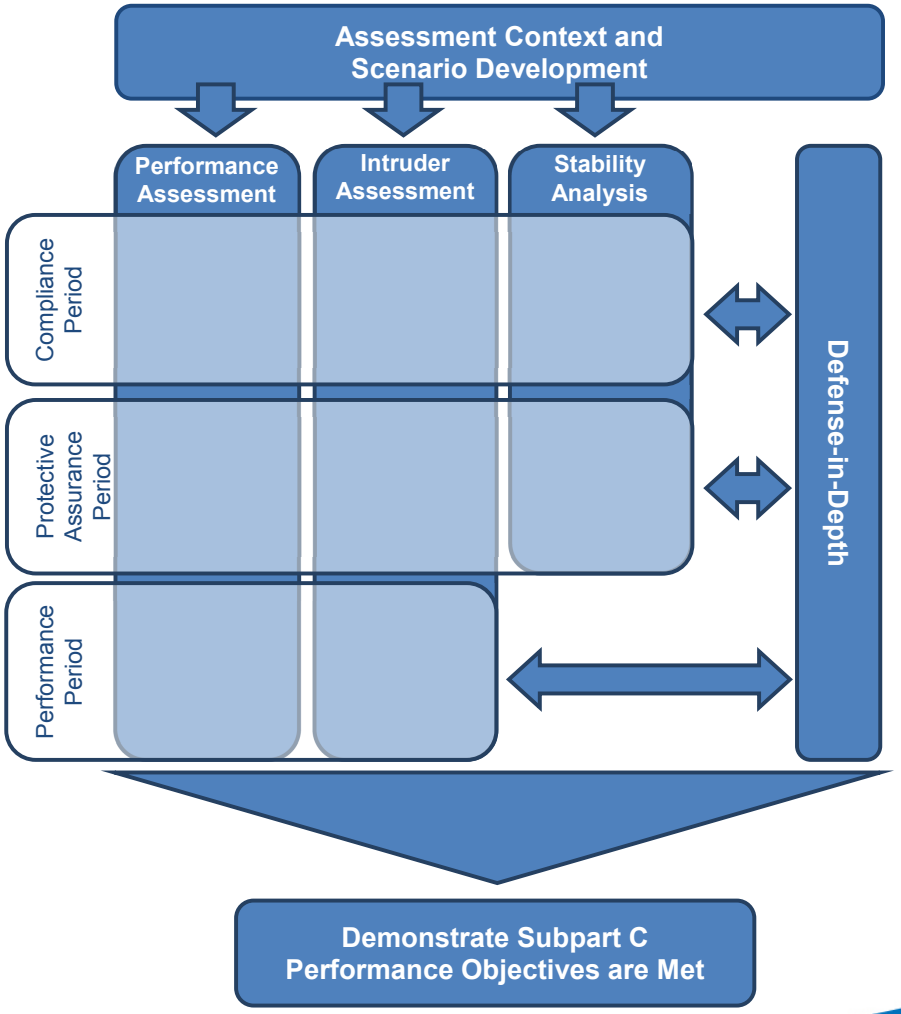

Analyses Timeframes

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- Complex issue
- Topic with extensive stakeholder input
- Staff developed white paper for initial recommendation (ML111030586)
- Commission directed changes to staff recommendation in SRM-SECY-13-0075
- Seek stakeholder input, especially on compatibility designation

Analyses Timeframes

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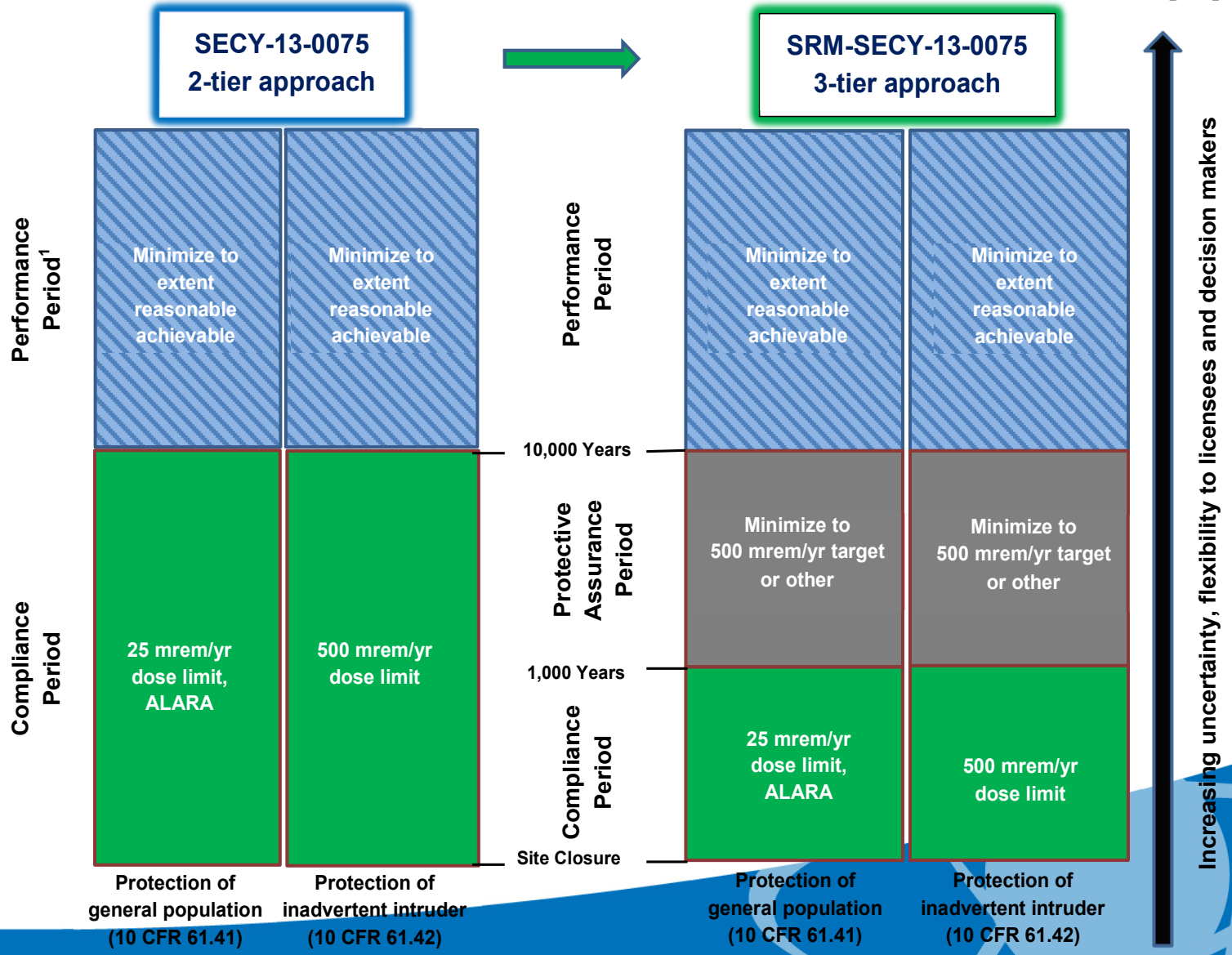

[1] Only applicable if concentrations on a facility-averaged basis are above Class A

Analyses Timeframes

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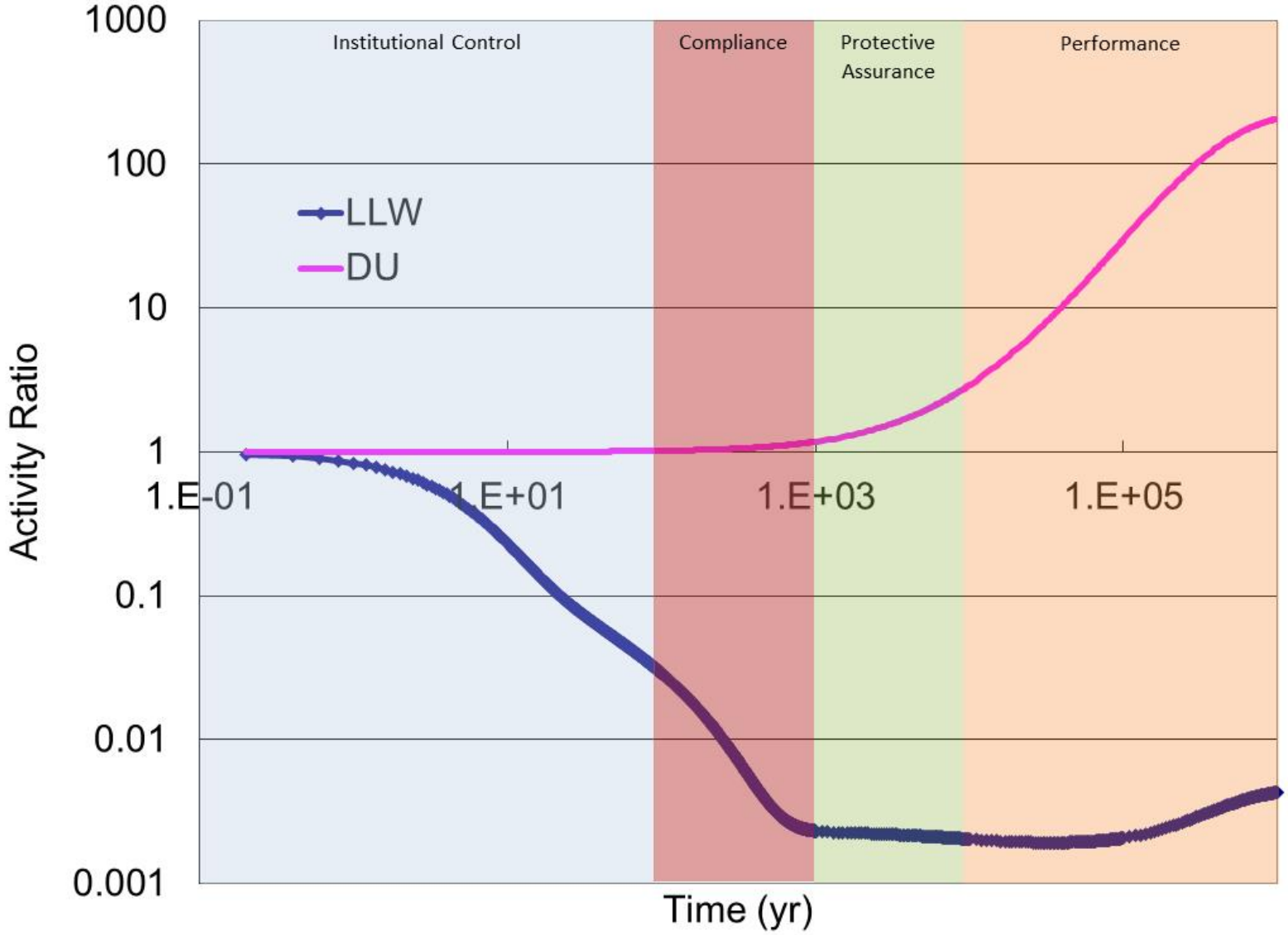

Analyses Timeframes

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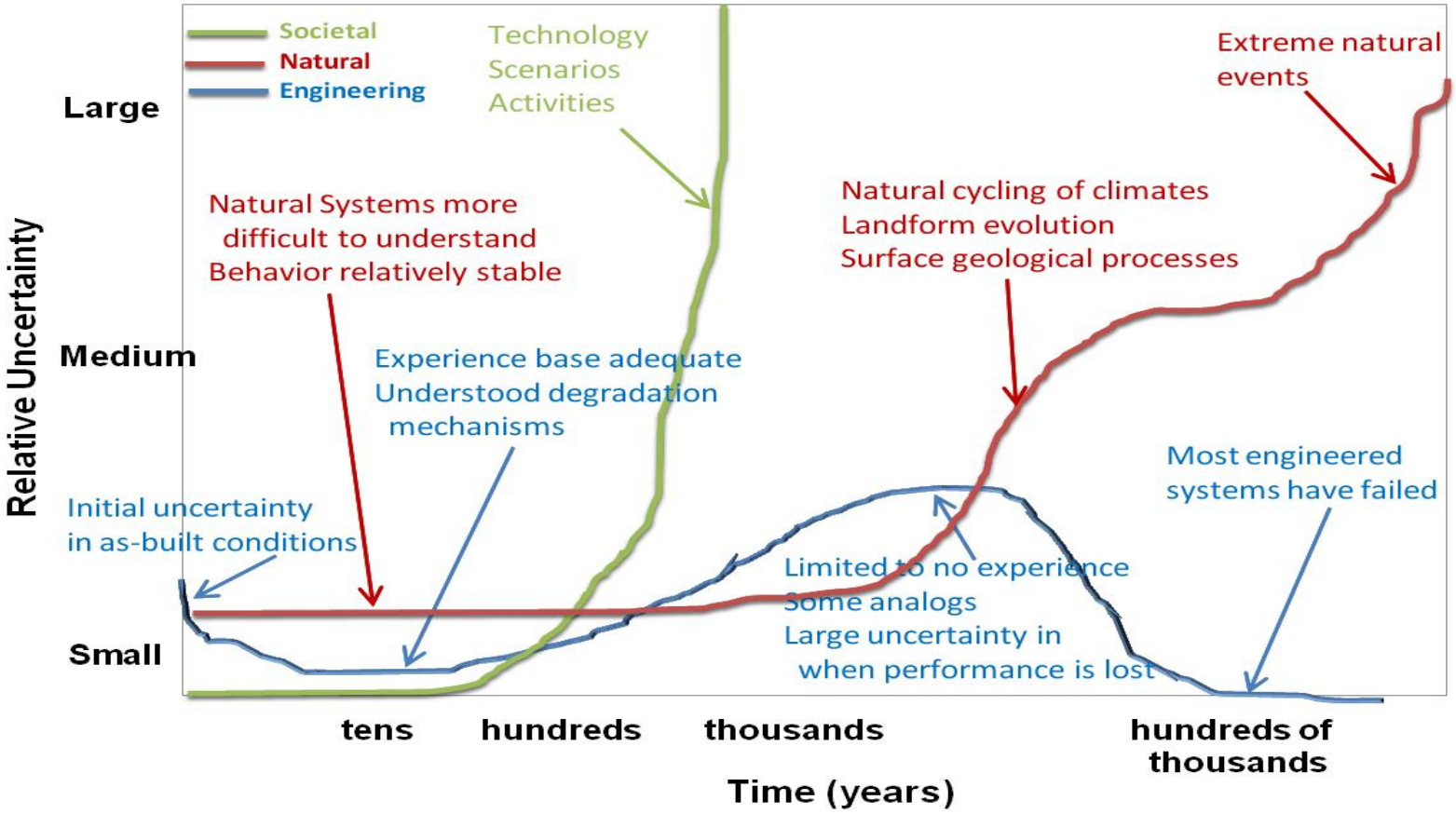

Analyses Timeframes

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Analyses Timeframes

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Seeking feedback on:

- Overall approach
- Compatibility
- Long-lived waste definition
- Table A – performance period analyses concentrations

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Panel discussion followed by comments and questions from the public.

Performance Assessment

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- Performance assessment is not a new topic – renaming of technical analyses
- Proposed modifications modernize the technical analyses requirements
- New requirements in 61.13:
  - Scope (features, events, and processes)
  - Uncertainty and variability
  - Model support

IMPLICIT

EXPLICIT

- Requirement to update the performance assessment at closure
- Modified siting characteristics consistent with disposal of long-lived waste

Performance Assessment

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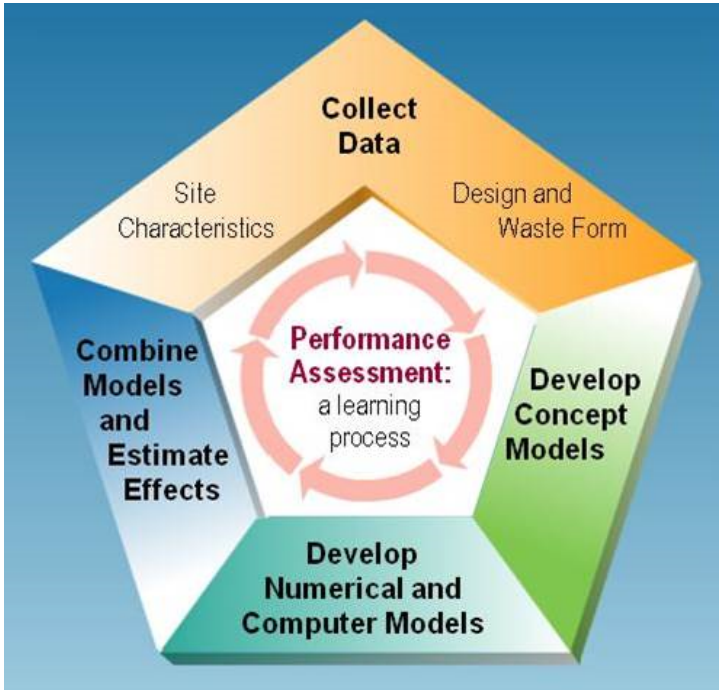
61.28: Updated PA at closure

61.50: Modified as a result of PA requirements for long-lived waste disposal



61.58: WAC "or" approach developed that allows the use of PA results

61.13: Provide model support and consider alternative conceptual models

61.13: Features, events, and processes (scope)

61.13: Results of PA used in DID analysis

61.13: Explicit consideration of uncertainty and variability

Performance Assessment

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Performance Assessment

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Performance Assessment

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Hazard Map Example

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Performance Assessment

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Seeking feedback on:

- Suitability of using technical analyses to evaluate the disposal of long-lived waste
- New technical analyses requirements (61.13)
- Modifications to siting characteristics requirements (61.50)
- Requirement to update the PA at closure (61.28)

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Panel discussion followed by comments and questions from the public.

Inadvertent Intruder Assessment

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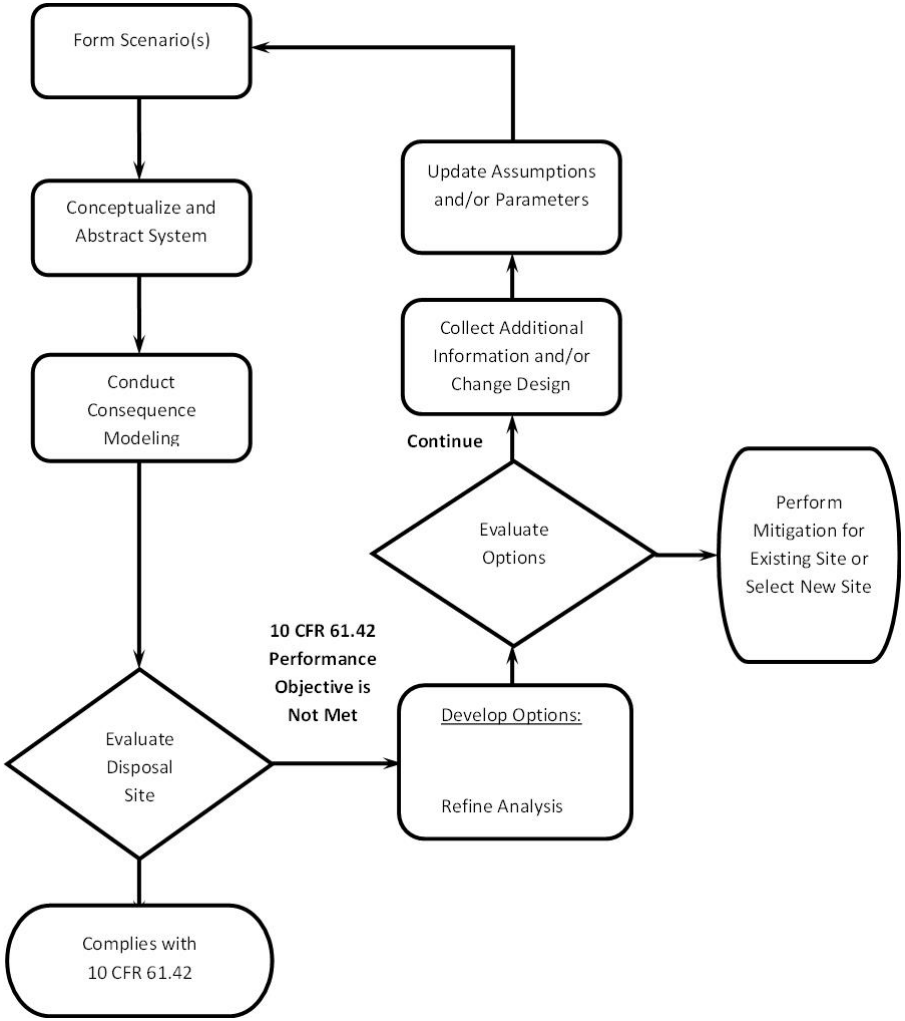
- Inadvertent Intruder Assessment is a new analysis
- Proposed modifications require a stylized analysis instead of solely relying on waste classification and the underlying generic analysis used to develop waste classification
- New requirements in 61.13:
  - Scope
  - Intruder Barriers
  - Uncertainty and variability
- Performance objective in 61.42
- Requirement to update intruder assessment at closure

Intruder Assessment



- Requires an intruder assessment analysis
- Based on intrusion scenarios that are realistic and consistent with expected activities in and around the disposal site at the time of site closure
- Dose limit of 500 mrem for compliance period

Inadvertent Intruder Assessment - 61.2

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Inadvertent intruder means a person who might occupy the disposal site after closure and engage in normal activities, such as agriculture, dwelling construction, resource exploration or exploitation (e.g., well drilling) or other reasonably foreseeable pursuits that might unknowingly expose the person to radiation from the waste included in or generated from a low level radioactive waste facility.

Intruder assessment is an analysis that (1) assumes an inadvertent intruder occupies the site and engages in normal activities or other reasonably foreseeable pursuits that are realistic and consistent with expected activities in and around the disposal site at the time of site closure and that might unknowingly expose the person to radiation from the waste; (2) examines the capabilities of intruder barriers to inhibit an inadvertent intruder's contact with the waste or to limit the inadvertent intruder's exposure to radiation; and (3) estimates an inadvertent intruder's potential annual dose, considering associated uncertainties.

Inadvertent Intruder Assessment – 61.7(c)

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(3) Inadvertent intruders might occupy the site in the future and engage in normal pursuits without knowing that they were receiving radiation exposure. Protection of inadvertent intruders can involve two principal controls: institutional control over the site after operations by the site owner to ensure that no such occupation or improper use of the site occurs; or, designating which waste could present an unacceptable dose to an intruder, and disposing of this waste in a manner that provides some form of intruder barrier that is intended to prevent contact with the waste. These regulations incorporate both types of protective controls.

Inadvertent Intruder Assessment – 61.7(c)

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(4) The intruder assessment must demonstrate protection of inadvertent intruders through the assessment of potential radiological exposures should an inadvertent intruder occupy the disposal site following a loss of institutional controls after closure. The intruder can be exposed to radioactivity that has been released into the environment as a result of disturbance of the waste or from radiation emitted from waste that is still contained in the disposal site. The results of the intruder assessment are compared with the appropriate performance objective of subpart C of this part. An intruder assessment can employ a similar methodology to that used for a performance assessment, but the intruder assessment must assume that an inadvertent intruder occupies the disposal site following a loss of institutional controls after closure, and engages in activities that unknowingly expose the intruder to radiation from the waste.

Inadvertent Intruder Assessment – 61.13(b)

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An **intruder assessment** shall:

(i) Assume that an inadvertent intruder occupies the disposal site at any time after the period of institutional controls ends, and engages in normal activities including agriculture, dwelling construction, resource exploration or exploitation (e.g., well drilling), or other reasonably foreseeable pursuits that are consistent with activities in and around the site at the time of closure and that unknowingly expose the intruder to radiation from the waste.

(ii) Identify adequate barriers to inadvertent intrusion that inhibit contact with the waste or limit exposure to radiation from the waste, and provide a basis for the time period over which barriers are effective.

(iii) Account for uncertainties and variability.

Protection of Inadvertent Intruders – 61.42

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(a) Design, operation, and closure of the land disposal facility must ensure protection of any inadvertent intruder into the disposal site who occupies the site or contacts the waste at any time after active institutional controls over the disposal site are removed. The annual dose must not exceed 5 milliSieverts (500 millirems) to any inadvertent intruder within the compliance period. Compliance with this paragraph must be demonstrated through analyses that meet the requirements specified in § 61.13(b).

(b) Design, operation, and closure of the land disposal facility shall minimize exposures to any inadvertent intruder into the disposal site at any time during the protective assurance period. The annual dose, established on the license, shall be below 5 milliSieverts (500 millirems) or a level that is supported as reasonably achievable based on technological and economic considerations in the information submitted for review and approval by the Commission. Compliance with this paragraph must be demonstrated through analyses that meet the requirements specified in § 61.13(b).

Protection of Inadvertent Intruders – 61.42

(c) Effort shall be made to minimize exposures to any inadvertent intruder to the extent reasonably achievable at any time during the performance period. Compliance with this paragraph must be demonstrated through analyses that meet the requirements specified in § 61.13(e).

Inadvertent Intruder Assessment

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Seeking feedback on:

- Revised and new definitions for intruder assessment (61.2)
- Revised concepts on intruder assessment (61.7)
- New technical analyses requirements (61.13)
- Requirement to update intruder assessment at closure (61.28)
- Revised performance objective for intruder assessment (61.42)

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Panel discussion followed by comments and questions from the public.

Protective Assurance Analyses

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- Complex issue
- Topic with extensive stakeholder input
- Staff developed white paper for initial recommendation (ML111030586)
- Commission directed changes to staff recommendation in SRM-SECY-13-0075
- Seek stakeholder input, especially on compatibility designation

Protective Assurance Analyses

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Protective Assurance Analyses

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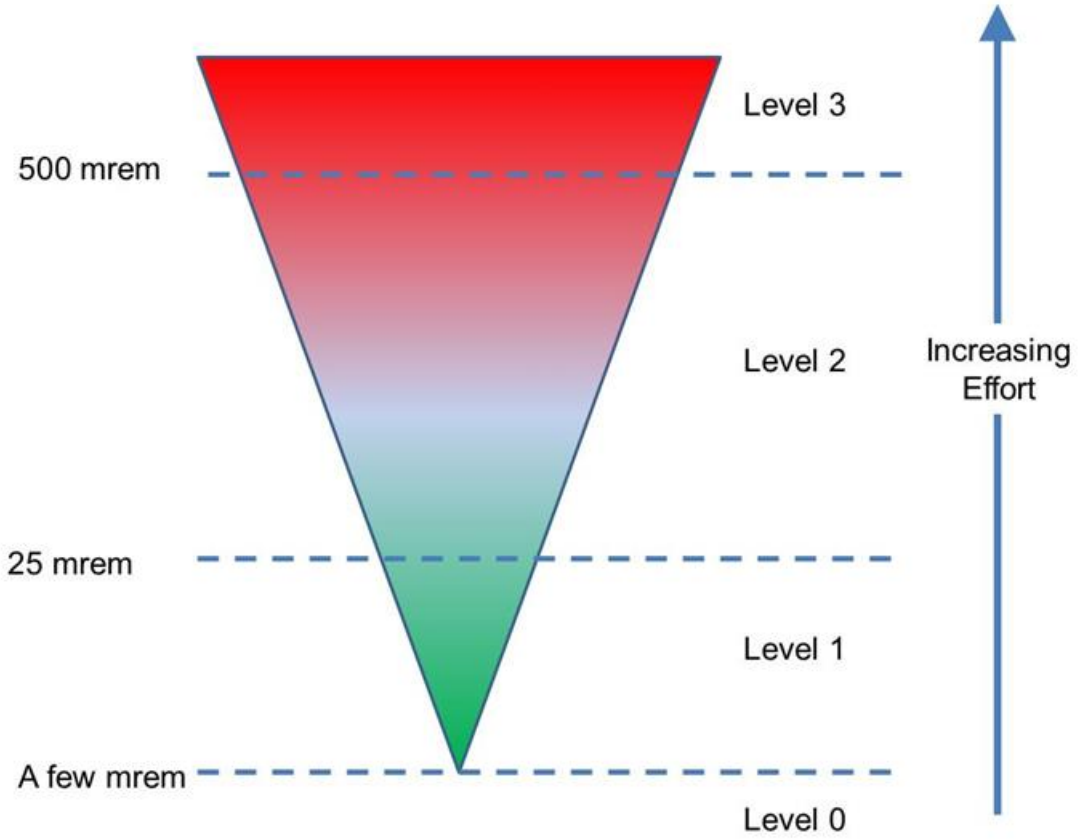

Protective Assurance Analyses

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Seeking feedback on:

- Protective assurance analyses requirements
- Extension of PA/IA to the protective assurance period
- Optimization approach
- Minimization target
- Risk-based discounting

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Panel discussion followed by comments and questions from the public.

Performance Period Analyses

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- Applicable to times after 10,000 years
- Applies only if sufficient waste is present (Table A)
- Concentrations based on facility average using sum of fractions approach
- Assess how the disposal site limits long-term impacts
- Identify design features and site characteristics
- Minimize impacts to the extent reasonably achievable

Performance Period Analyses

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Table A - Average Concentrations of Long-lived Radionuclides Requiring Performance Period Analyses

Radionuclide	Concentration (Ci/m^3)[1]
C-14	0.8
C-14 in activated metal	8
Ni-59 in activated metal	22
Nb-94 in activated metal	0.02
Tc-99	0.3
I-129	0.008
Long-lived alpha-emitting nuclides[2]	10[3]
Pu-241	350[3]
Cm-242	2,000[3]

[1] Values derived from § 61.55 Class A limits.
[2] Includes alpha-emitting transuranic nuclides as well as other long-lived alpha-emitting nuclides.
[3] Units are nanocuries per gram.

Performance Period Analyses

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Performance Period Example

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Table 7-1 Long-lived Isotopes Potentially Present in LLW Performance Assessment Inventories

Isotope	Half-life (yr)	Long-lived		LLW PA Inventory[1]	Isotope	Half-life (yr)	Long-lived		LLW PA Inventory[1]
		Parent	Progeny[2]				Parent	Progeny[2]	
Al-26	7.17×10^5	X			U-233	1.59×10^5	X	Th-229	Yes
C-14	5,730	X		Yes	U-234	2.45×10^5	X	Th-230	Yes
Cl-36	3.01×10^5	X		Yes	U-235	7.038×10^8	X	Pa-231	Yes
K-40	1.3×10^9	X			U-236	2.342×10^6	X	Th-232	Yes
Ni-59	7.5×10^4	X		Yes	U-238	4.468×10^9		U-234	Yes
Se-79	1.1×10^6	X			Np-237	2.14×10^6	X	U-233	Yes
Zr-93	1.53×10^6	X			Pu-238	87.7		U-234	Yes
Nb-94	2.0×10^4	X			Pu-239	2.41×10^4	X	U-235	Yes
Tc-99	2.14×10^5	X		Yes	Pu-240	6.54×10^3	X	U-236	Yes
Pd-107	6.56×10^6	X			Pu-241	14.4		Np-237	Yes
Sn-126	1×10^5	X			Pu-242	3.76×10^5	X	U-238	Yes
I-129	1.6×10^7	X		Yes	Pu-244	8.26×10^7	X	Pu-240	
Cs-135	3×10^6	X			Am-241	432		Np-237	Yes
Sm-146	1×10^8	X			Am-242m	16 hr		U-234	Yes
Pm-147	2.62		Sm-147		Am-243	7.38×10^3	X	Pu-239	Yes
Sm-147	1.06×10^{11}	X			Cm-242	0.446		U-234	
Eu-152	13.3		Gd-152		Cm-243	28.5		Am-243	
Gd-152	1.08×10^{14}	X			Cm-244	18.1		Pu-240	
Ra-226	1,600	X		Yes	Cm-245	8.5×10^3	X	Np-237	
Th-229	7.3×10^3	X		Yes	Cm-247	1.56×10^7	X	Am-243	
Th-230	7.7×10^4	X	Ra-226	Yes	Cm-248	3.39×10^5	X	Pu-244	
Th-232	1.41×10^{10}	X		Yes	Cf-249	351		Cm-245	
Pa-231	3.28×10^4	X			Cf-251	898		Am-243	
U-233	1.59×10^5	X	Th-229	Yes	Cf-252	2.64		Cm-248	

Performance Period Analyses

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Seeking feedback on:

- Approach to the performance period analyses
- Use of Class A values as a trigger for the requirements
- Averaging approach to concentrations
- Minimization to the extent reasonably achievable
- The requirement to identify the features that contribute to limiting long-term impacts

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Panel discussion followed by comments and questions from the public.

Safety Case/Defense-in-Depth

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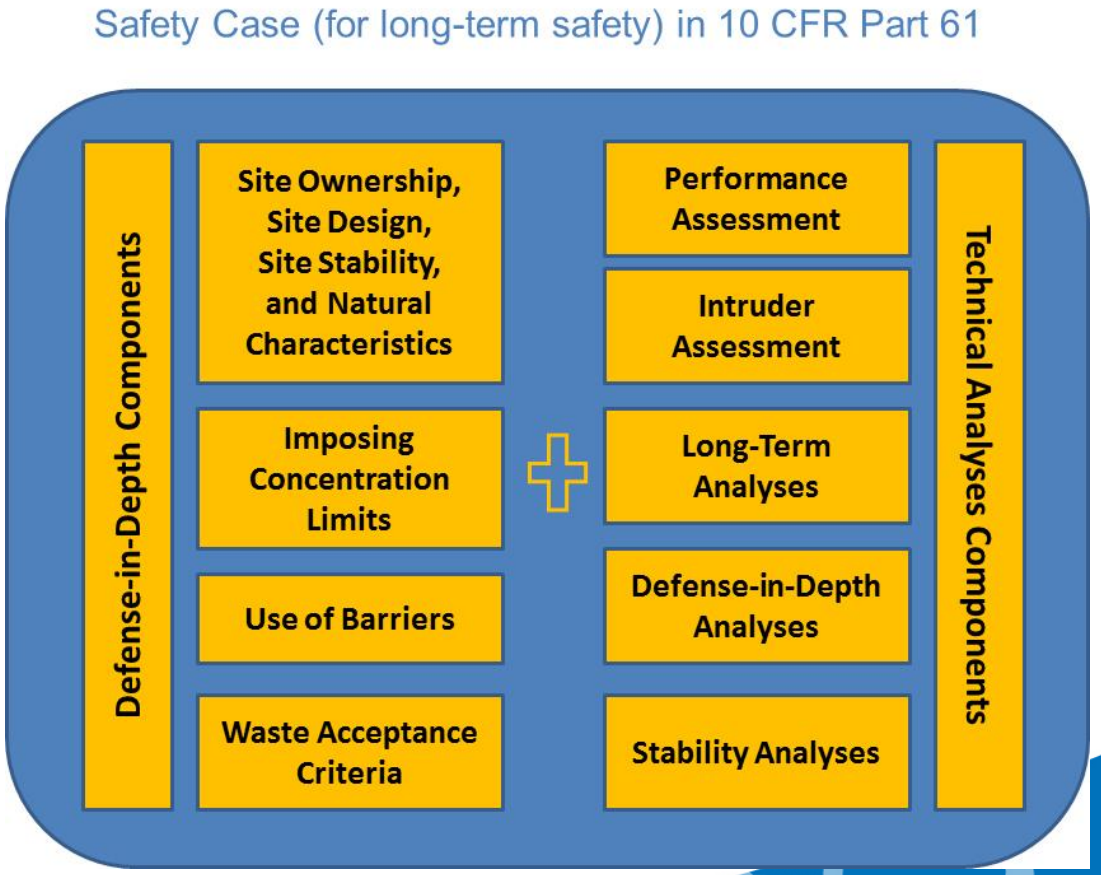
- Proposed rule includes discussion of safety case and defense-in-depth (DID) protections
- Explains how the combination of DID and performance assessment (i.e., safety case) should be used to support the licensing decision



Safety Case – 61.2

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Safety case is a collection of information that demonstrates the assessment of the safety of a waste disposal facility. This includes technical analyses, such as the performance assessment and intruder assessment, but also includes information on defense-in-depth and supporting evidence and reasoning on the strength and reliability of the technical analyses and the assumptions made therein. The safety case also includes description of the safety relevant aspects of the site, the design of the facility, and the managerial control measures and regulatory controls.

Safety Case – 61.7

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(g) …The potential applicant uses these data and analyses to develop a safety case that describes the safety relevant aspects of the site, the design of the facility, and the managerial control measures and regulatory controls. The safety case demonstrates the level of protection of people and the environment and provides reasonable assurance that the performance objectives will be met.…

Safety Case – 61.10

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(b) The information provided in an application comprises the safety case and supports the licensee's demonstration that the disposal facility will be constructed and operated safely and provides reasonable assurance that the disposal site will be capable of isolating waste and limiting releases to the environment.

Defense-in-Depth – 61.2

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Defense-in-depth means the use of multiple independent and redundant layers of defense such that no single layer, no matter how robust, is exclusively relied upon. Defense-in-depth for a land disposal facility includes, but is not limited to, the use of siting, waste forms and radionuclide content, engineered features, and natural geologic features of the disposal site.

Defense-in-Depth – 61.7

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(d) *Defense-in-depth*. With respect to waste disposal, defense-in-depth is the use of multiple independent and redundant layers of defense to compensate for uncertainties in the estimation of long-term performance. Defense-in-depth protections, commensurate with the risks, are intended to ensure that no single layer, no matter how robust, is exclusively relied upon by the disposal system to provide protection of the public and environment from radiation that may be released from the facility to the environment. Defense-in-depth protections, such as siting, wasteforms, radiological source-term, engineered features, and natural system features of the disposal site, combined with technical analyses and scientific judgment form the safety case for licensing a low-level waste disposal facility. The insights derived from technical analyses include supporting evidence and reasoning on the strength and reliability of the layers of defense relied upon in the safety case. These insights provide input for making regulatory decisions.

Defense-in-Depth – 61.13

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(f) Analyses that demonstrate the proposed disposal facility includes defense-in-depth protections.

Safety Case/Defense-in-Depth

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Seeking feedback on:

- Definitions for safety case and defense-in-depth (61.2)
- Concepts regarding safety case and defense-in-depth (61.7)
- Requirements for a safety case (61.10)
- New technical analyses requirements for defense-in-depth (61.13)
- Requirement to update defense-in-depth at closure (61.28)

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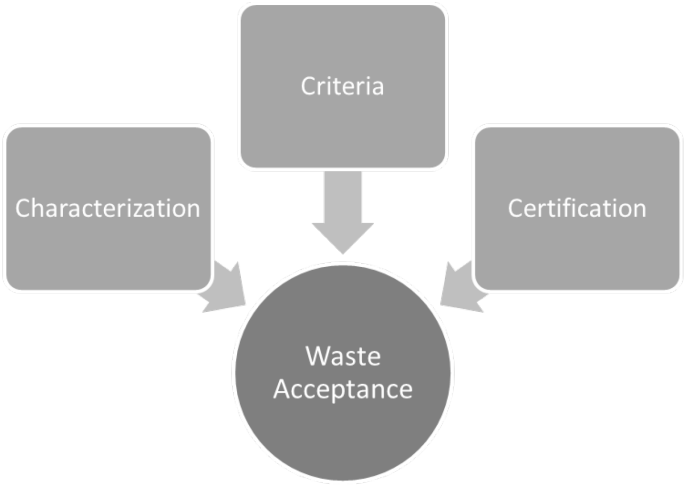
Panel discussion followed by comments and questions from the public.

Waste Acceptance



- New requirements for developing waste acceptance criteria (WAC) using either:
  - 61.55 waste classification system, or
  - Site-specific WAC
- New 61.58 focuses on three areas:
  - WAC
  - Waste Characterization
  - Waste Certification

Waste Acceptance – 61.7

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(e) *Waste acceptance.* Demonstrating compliance with the performance objectives also requires a determination of criteria for the acceptance of waste. The criteria can be determined from the results of the technical analyses that demonstrate compliance with the performance objectives for any land disposal facility or, for a near-surface disposal facility, the waste classification requirements of subpart D of this part.

Waste Acceptance Criteria – 61.58

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(a) *Waste acceptance criteria.* Each applicant shall provide, for approval by the Commission, criteria for the acceptance of waste for disposal that provide reasonable assurance of compliance with the performance objectives of subpart C of this part. Waste acceptance criteria shall specify, at a minimum, the following:

(1) Allowable activities and concentrations of specific radionuclides. Allowable activities and concentrations shall be developed from the technical analyses required by either § 61.13 for any land disposal facility or the waste classification requirements set forth in § 61.55 for a near-surface disposal facility.

(2) Acceptable wasteform characteristics and container specifications. The characteristics and specifications shall meet the minimum requirements for waste characteristics set forth in §61.56(a) for all waste, and the requirements in § 61.56(b) for waste that requires stability to demonstrate compliance with the performance objectives of subpart C of this part.

(3) Restrictions or prohibitions on waste, materials, or containers that might affect the facility's ability to meet the performance objectives in subpart C of this part.

Waste Characterization – 61.58

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(b) *Waste characterization.* Each applicant shall provide, for Commission approval, acceptable methods for characterizing the waste for acceptance. The methods shall identify the characterization parameters and acceptable uncertainty in the characterization data. The following information, at a minimum, shall be required to characterize waste:

(1) Physical and chemical characteristics;
(2) Volume, including the waste and any stabilization or absorbent media;
(3) Weight of the container and contents;
(4) Identities, activities, and concentrations;
(5) Characterization date;
(6) Generating source; and
(7) Any other information needed to characterize the waste to demonstrate that the waste acceptance criteria set forth in § 61.58(a) are met.

Waste Certification – 61.58

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(c) *Waste certification*. Each applicant shall provide, for Commission approval, a program to certify that waste meets the acceptance criteria prior to shipment to the disposal facility. The certification program shall:

(1) Designate authority to certify and receive waste for disposal at the disposal facility.
(2) Provide procedures for certifying that waste meets the waste acceptance criteria.
(3) Specify documentation required for waste acceptance including waste characterization, shipment (including the requirements set forth in appendix G of 10 CFR part 20), and certification.
(4) Identify records, reports, tests, and inspections that are necessary to comply with the requirements in § 61.80.
(5) Provide approaches for managing waste that has been certified as meeting the waste acceptance criteria in a manner that maintains its certification status.

Waste Acceptance

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Seeking feedback on:

- Concepts regarding waste acceptance (61.7)
- Requirements for waste acceptance (61.58)

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Panel discussion followed by comments and questions from the public.

Guidance Document

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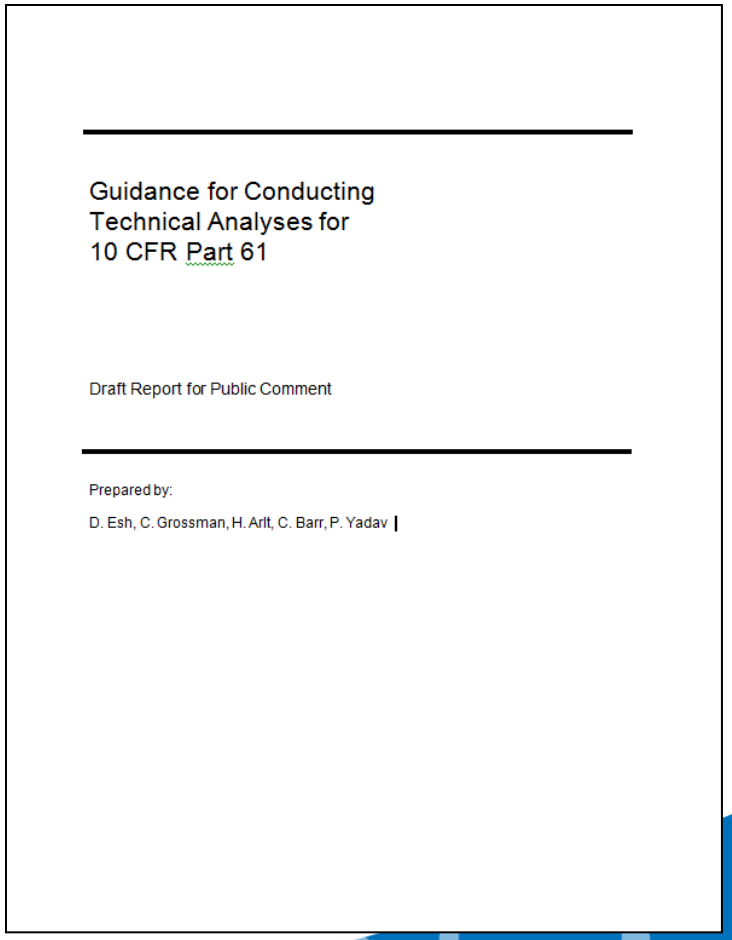
- Overview/context (Chapter 1)
- Examples, tables, figures
- Use of other NRC guidance documents (Chapter 11)
- 434 pages, 18 pages of references
- Glossary
- Appendices (e.g. hazard maps, FEPs)



Guidance for Conducting
Technical Analyses for
10 CFR Part 61

Draft Report for Public Comment

Prepared by:

D. Esh, C. Grossman, H. Arlt, C. Barr, P. Yadav

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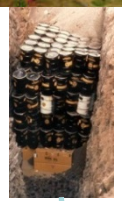
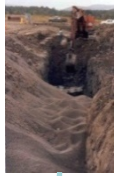
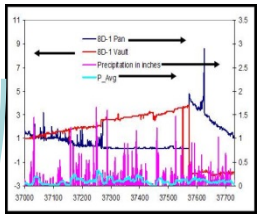
Backup

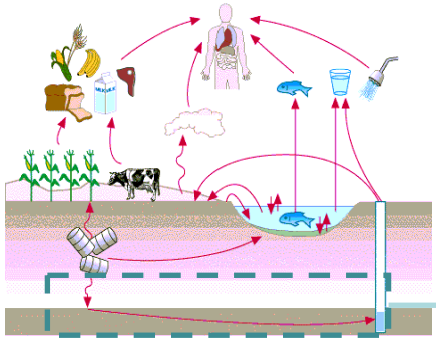
Example - PA



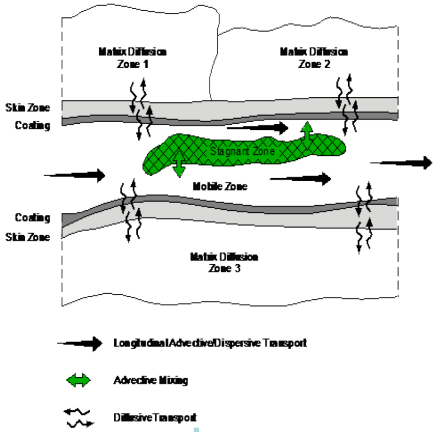




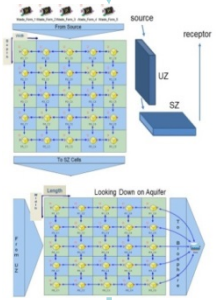
Site characterization data

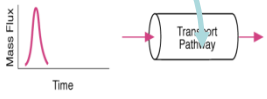


Performance assessment and other conceptual model development



Hydrologic conceptual model





Estimated system

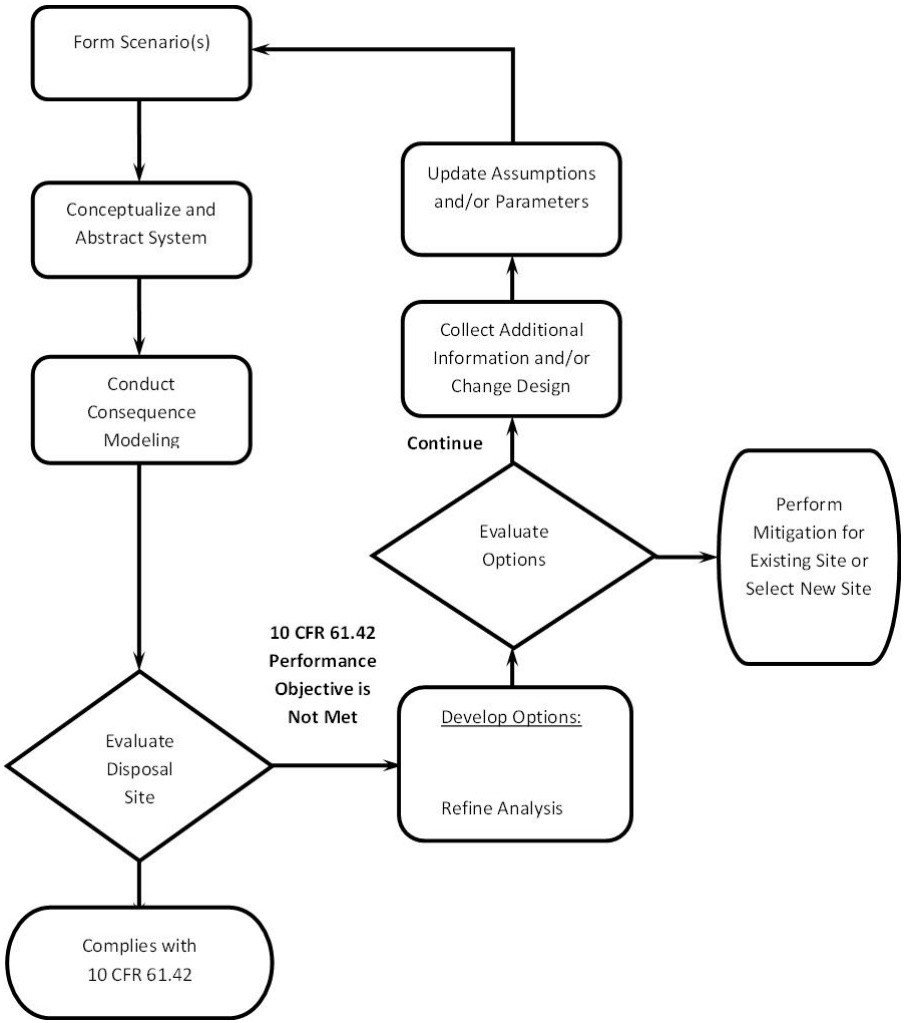
Abstracted hydrologic

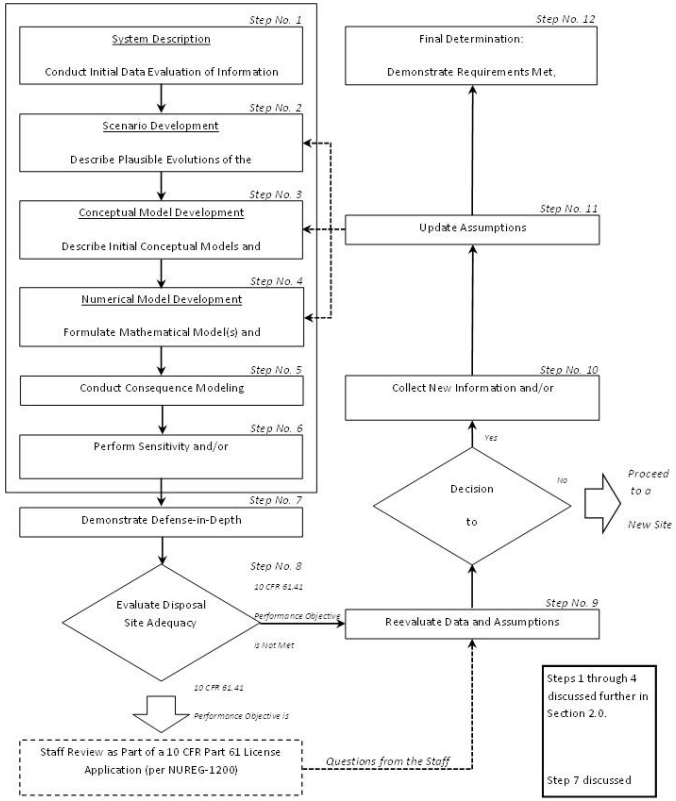
Spatial and temporal discretization

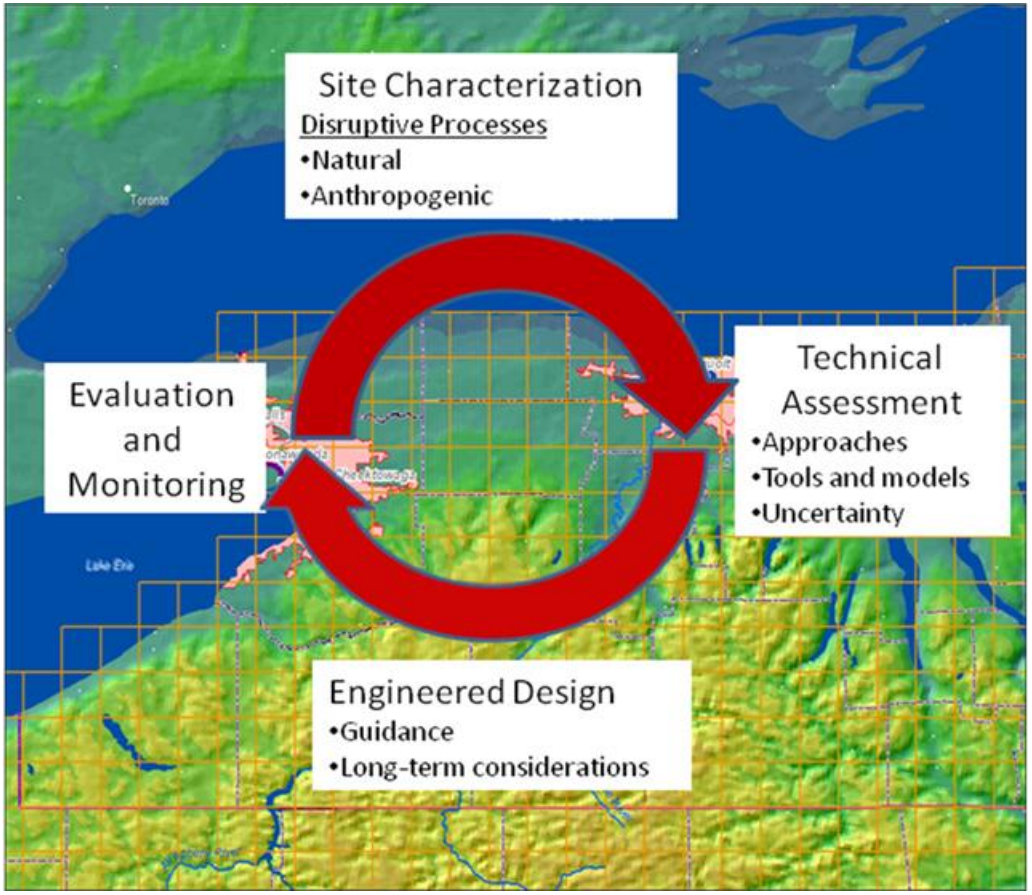
Numerical model

$$m'_{is} = -m_{is}\lambda_s + \sum_{p=1}^{NPs} m_p \lambda_p f_{ps} R_{sp} (A_s/A_p) + \sum_{c=1}^{NCi} f_{cs} + S_{is}$$

Flowcharts


Form Scenario(s)
Conceptualize and Abstract System
Conduct Consequence Modeling
Evaluate Disposal Site
Complies with 10 CFR 61.42
10 CFR 61.42 Performance Objective is Not Met
Develop Options:
Refine Analysis
Update Assumptions and/or Parameters
Collect Additional Information and/or Change Design
Continue
Evaluate Options
Perform Mitigation for Existing Site or Select New Site


Step No. 1
System Description
Conduct Initial Data Evaluation of Information
Step No. 2
Scenario Development
Describe Plausible Evolutions of the
Step No. 3
Conceptual Model Development
Describe Initial Conceptual Models and
Step No. 4
Numerical Model Development
Formulate Mathematical Model(s) and
Step No. 5
Conduct Consequence Modeling
Step No. 6
Perform Sensitivity and/or
Step No. 7
Demonstrate Defense-in-Depth
Step No. 8
10 CFR 61.41
Evaluate Disposal Site Adequacy
Performance Objective Is Not Met
10 CFR 61.41
Performance Objective is
Staff Review as Part of a 10 CFR Part 61 License Application (per NUREG-1200)
Questions from the Staff
Step No. 9
Reevaluate Data and Assumptions
Step No. 10
Collect New Information and/or
Yes
Decision
No
Proceed to a New Site
Step No. 11
Update Assumptions
Step No. 12
Final Determination:
Demonstrate Requirements Met,
Steps 1 through 4 discussed further in Section 2.0.
Step 7 discussed

Site-Stability Example

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