

# Facilitator Introduction

**Bret Leslie, PhD**

NRC Public Meeting on Potential Changes to Commercial  
LLW Regulation: 10 CFR Part 61

May 15, 2012  
Cooper Hotel Conference Center  
Dallas, Texas 75230

# **NRC Public Meeting on Potential Changes to Commercial LLW Regulation: 10 CFR Part 61**

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**May 15, 2012  
Cooper Hotel Conference Center  
Dallas, Texas 75230**

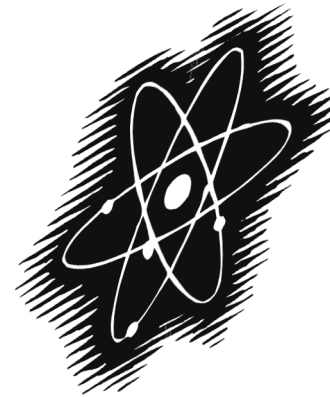
# Welcome

- **Seek Stakeholder Feedback on Part 61 Revisions**
  - Recent Commission Direction (January 19, 2012, SRM)
  - Emerging Policy/Technical Issues
  - Comprehensive Part 61 Revision (SECY-10-0165)
  
- **Today's Meeting: Second of Three Public Meetings**
  - Overview/Background (Persinko)
  - Ongoing Part 61 Rulemaking (Esh)
  - Emerging Technical Issues (Suber)
  - Comprehensive Part 61 Revision (Suber)

# Overview

- LLW Program Perspective
- Commission Directives
- Staff's Approach
- Timeline
- LLW Background

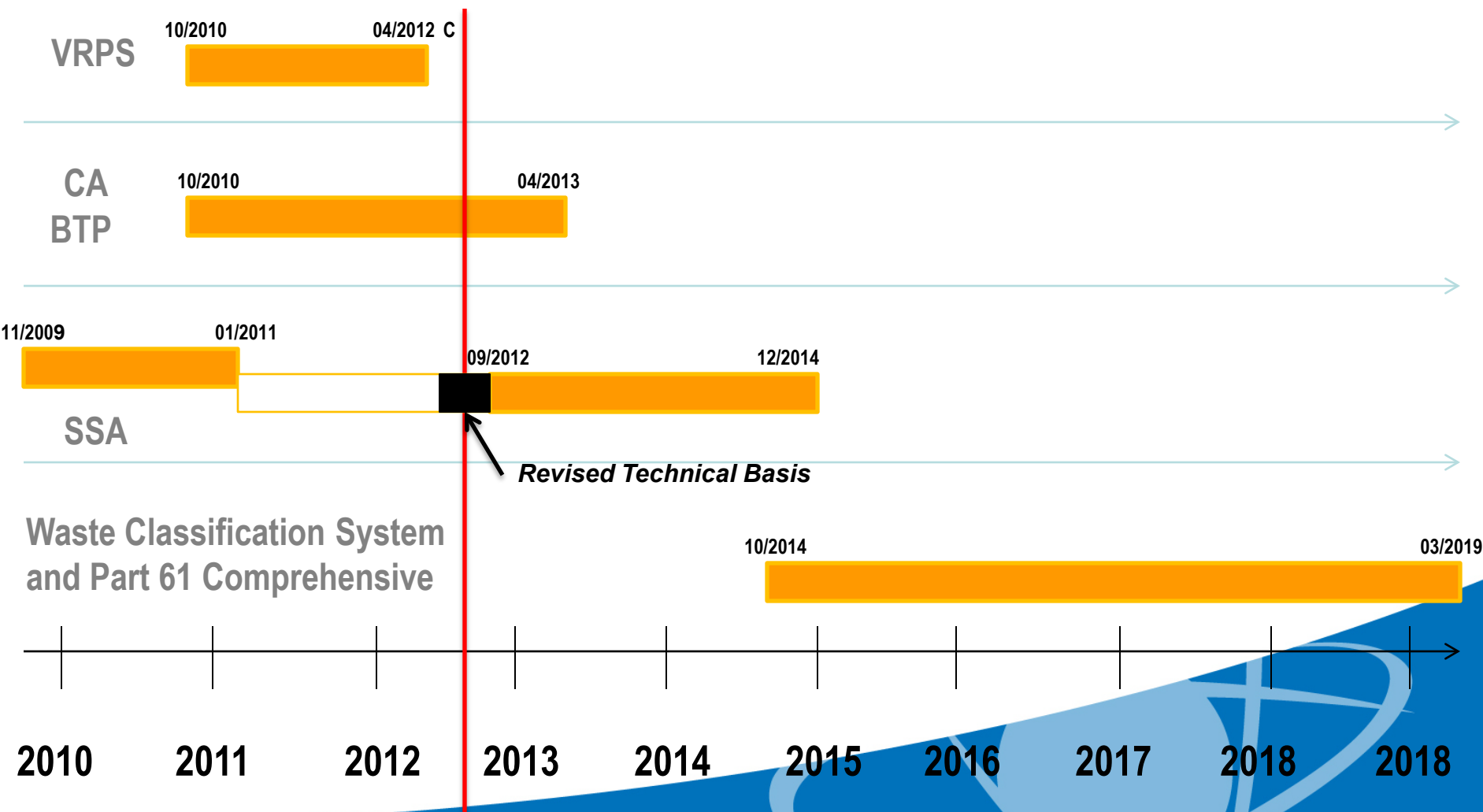




# LLW PROGRAM PERSPECTIVE



# LLW Program Timeline



**05/2012**

# Stakeholder Input: Recent Events

<b>EVENT</b>	<b>DATE</b>
<b>Conduct public workshop on CA BTP *</b>	<b>February 2011</b>
<b>DOE/NRC workshop on Part 61 Revision (Phoenix) *</b>	<b>March 2011</b>
<b>Issue blending Interim Guidance</b>	<b>March 2011</b>
<b>Close comment period on CA BTP *</b>	<b>April 2011</b>
<b>Conduct public meeting on Part 61 Period of Performance *</b>	<b>May 2011</b>
<b>Brief ACRS on Part 61 SSA Rulemaking (2x)</b>	<b>July/August 2011</b>
<b>Brief ACRS on CA BTP (2x)</b>	<b>June/December 2011</b>
<b>Issue draft VRPS for public comment *</b>	<b>October 2011</b>
<b>Conduct public workshop on CA BTP (Albuquerque) *</b>	<b>October 2011</b>
<b>Issue Commission paper with proposed final VRPS</b>	<b>January 2012</b>



# COMMISSION DIRECTIVES

# Initial Commission Direction

- Require site-specific analyses to demonstrate compliance with the performance objectives
- Specify technical requirements of the analyses
- Develop accompanying guidance
- Other Assignments

# Recent Commission Direction (01.19.2012)

- Process
- Policy
- Timeline
- Public Outreach

# Commission Direction (continued)

- Policy:
  - Flexibility to use current International Commission on Radiological Protection (ICRP) dose methodologies
  - Two-tiered period of performance:
    - Reasonably foreseeable compliance period
    - Longer period of performance that is not *a priori*
  - Flexibility to establish site-specific waste acceptance criteria
  - Balance Federal-State alignment and flexibility

# Other Commission Direction

- Comprehensive Risk-Informed Revision to Part 61
  - Risk-Inform the Current Part 61 Waste Classification Framework
  - Comprehensive Revision
  - Site-Specific Waste Acceptance Criteria
  - International Alignment
  - Supersede Direction in SECY-08-0147



# Commission Direction Overall View

## SRM 08-0147 – Depleted Uranium

- Budget for risk-informing waste classification tables
  - o Latest ICRP methodology
  - o Classify DU
- Site Specific Analysis rulemaking

## SRM COMWDM-11-0002/COMGEA-11-0002 – Part 61 Revision

- Allow ICRP flexibility
- Two tiered approach reasonably foreseeable compliance pd
- Waste Acceptance Criteria
- Compatibility category

## SRM M100617B – Blending Commission Meeting

- Provide approach to initiating risk-informed  
/performance-based comprehensive revision to Part 61

## SECY 10-0165 Comprehensive Revision to Part 61

Solicit stakeholder views on:

- Risk inform Waste Classification Tables
- 1) ICRP; 2) Classify DU
- Comprehensive Revision to Part 61 (“Big C”)
- Waste Acceptance Criteria (WAC)
- International Alignment
- Supersede SECY 08-0147 (status quo)



# EMERGING ISSUES



# Technical/Policy Issues

- Role of Institutional Controls
- Exposure Scenarios
- §61.55 Concentration Tables
- Engineered Barrier System Performance
- Clearance
- Part 61 EIS
- Protection of Intruder



# STAFF'S APPROACH

# Maximizing Stakeholder Input: 10 CFR Part 61

LOCATION	DATE	EVENT
Phoenix, AZ	March 2, 2012 C	NRC-Sponsored Public Meeting #1 (following WM2012 Meeting)
San Francisco, CA	April 23, 2012 C	LLW Forum Spring Meeting
Orlando, FL	May 7, 2012 C	CRCPD/OAS Annual Meeting
Dallas, TX	May 15, 2012 C	NRC-Sponsored Public Meeting #2
Internet	Late May 2012	OAS Part 61 Rulemaking Webinar
Tucson, AZ	June 22, 2012	EPRI Annual LLW Meeting
Rockville, MD	Mid-July, 2012	NRC-Sponsored Public Meeting #3

# March 2, 2012, Public Meeting Feedback

- Need for Part 61 Rulemaking Crosswalk ←
- Expanded Coordination with Agreement States ←
- Consider Other Revisions to Part 61
  - Update §61.55 waste classification tables
  - Extend duration of institutional controls
  - Revisit Part 20, Appendix G manifest reporting requirements
  - GTCC disposal criteria
  - LAW disposal criteria
- Don't pursue SECY-10-0165 at this time

# 10 CFR Part 61 Rulemaking Crosswalk

- Click on Link for Crosswalk (ADAMS [ML120950198](#))

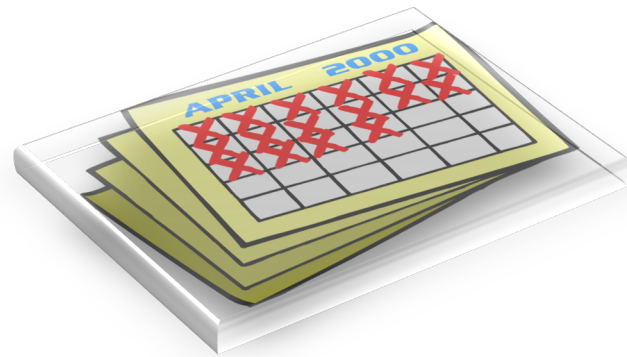
# Agreement State Feedback

- **Contacts**
  - 4 sited Agreement States (SC, UT, WA, and TX) plus PA and TN
  - OAS/CRCPD Orlando May 2012 Meeting
  - Late May Webinar (proposed)
  
- **Commission's Expanded Rulemaking Scope**
  - ICRP dosimetry flexibility: *Support*
  - Foreseeable future: *Support for: <20K yrs/10K yrs/further consideration*
  - WAC flexibility: *Support with some reservations/concerns*
  - Compatibility designations: *TOC – compatibility 'C' /Further Consideration*



# Agreement State Feedback (*continued*)

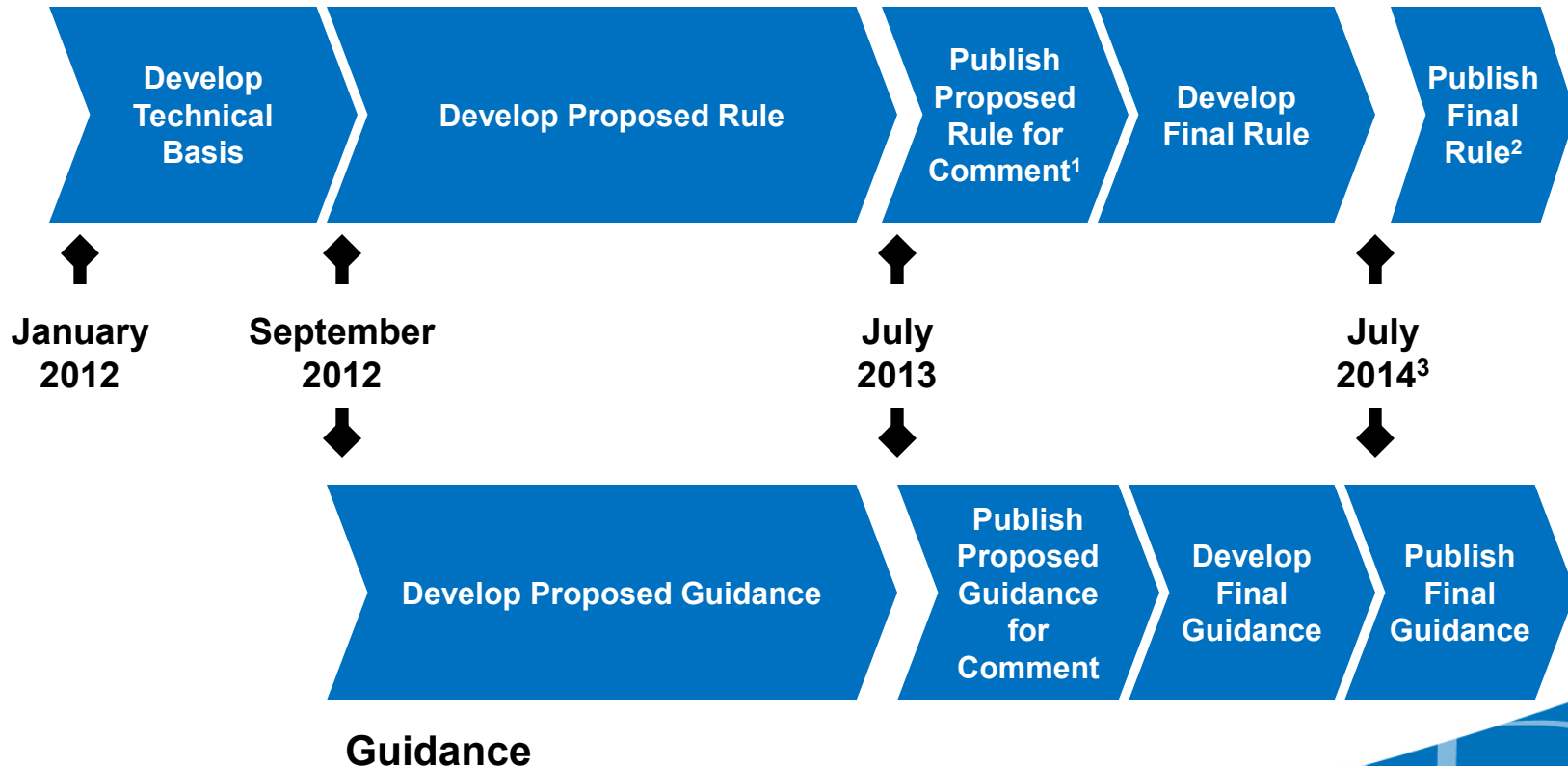
- Other Comments/Concerns
  - States should not be forced to take large quantities of DU
  - Part 20, Appendix G manifest reporting: *Further consideration*
  - Institutional controls: *Mixed*



# TIMELINE

# Site-Specific Analysis Rulemaking

## Rulemaking



<sup>1</sup> Pending Commission approval; Comment period lasts approximately 75 days

<sup>2</sup> Pending Commission approval

<sup>3</sup> Dependent upon the complexity of public comments received



# LLW BACKGROUND

# 10 CFR Part 61



- Requirements for land disposal of LLW
- Performance objectives assure safe disposal
  - Protection of general public
  - Protection of inadvertent intruders
  - Protection of individuals during operations
  - Stability after site closure
- Demonstrate performance via technical analyses and waste classification

# Recent Developments



- Waste classification limits based on 1980's understanding of low-level waste streams<sup>1</sup>
- Recent waste streams not envisioned during development of Part 61
- Near-surface disposal may be appropriate, but not under all conditions<sup>2</sup>

# Site-Specific Analyses Rulemaking

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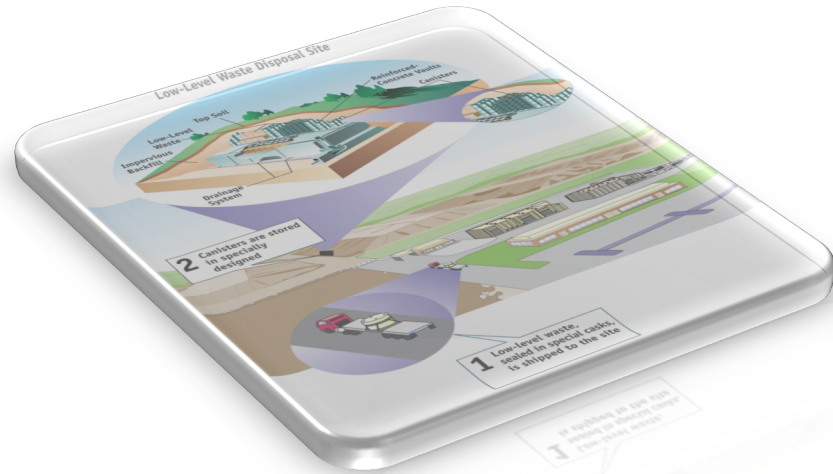
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# Overview

- Site-Specific Analyses
- Issues
- Path Forward





# SITE-SPECIFIC ANALYSES

## Overview of Performance Assessment

### What is Performance Assessment?

- Systematic analysis of what could happen at a site

### What is assessed?

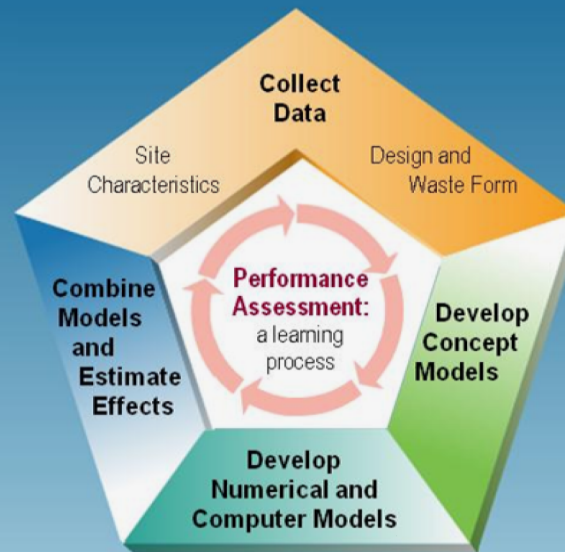
- What can happen?
- How likely is it?
- What can result?

### Why use it?

- Complex system
- Systematic way to evaluate data
- Internationally accepted approach

### How is it conducted?

- Collect data
- Develop scientific models
- Develop computer code
- Analyze results



### NRC would require a Performance Assessment to:

- Provide site and design data
- Describe barriers that isolate waste
- Evaluate features, events, and processes that affect safety
- Provide technical basis for models and inputs
- Account for variability and uncertainty
- Evaluate results from alternative models, as needed

# Intruder Assessment

- Demonstrate protection of inadvertent intruder
  - Currently Part 61 relies on waste classification
- Identify design and control measures to:
  - Preclude intrusion
  - Limit radiological impacts
- Similar to PA, except assumes intrusion

# Long-Term Assessment



- Estimates potential performance beyond compliance period
- Identify features to reduce long-term impacts



# NEW DIRECTION

# ICRP Methodology: *Direction*

- Consider allowing licensees the flexibility to use ICRP dose methodologies in a site-specific performance assessment for the disposal of all radioactive waste

# ICRP Methodology: Context



- NRC regulations based on various methodologies
- Commission policy<sup>1</sup> presently allows exemption for current methodology

# ICRP Methodology: *Feedback*

- Commission is seeking stakeholder feedback on allowing licensee's the flexibility to use ICRP dose methodologies in a site-specific performance assessment for the disposal of radioactive waste



# March 2 Public Meeting (Phoenix): Feedback

- Stakeholder support for allowing licensees the flexibility to use ICRP dose methodologies in a site-specific performance assessment for the disposal of radioactive waste

# Period of Performance: *Direction*

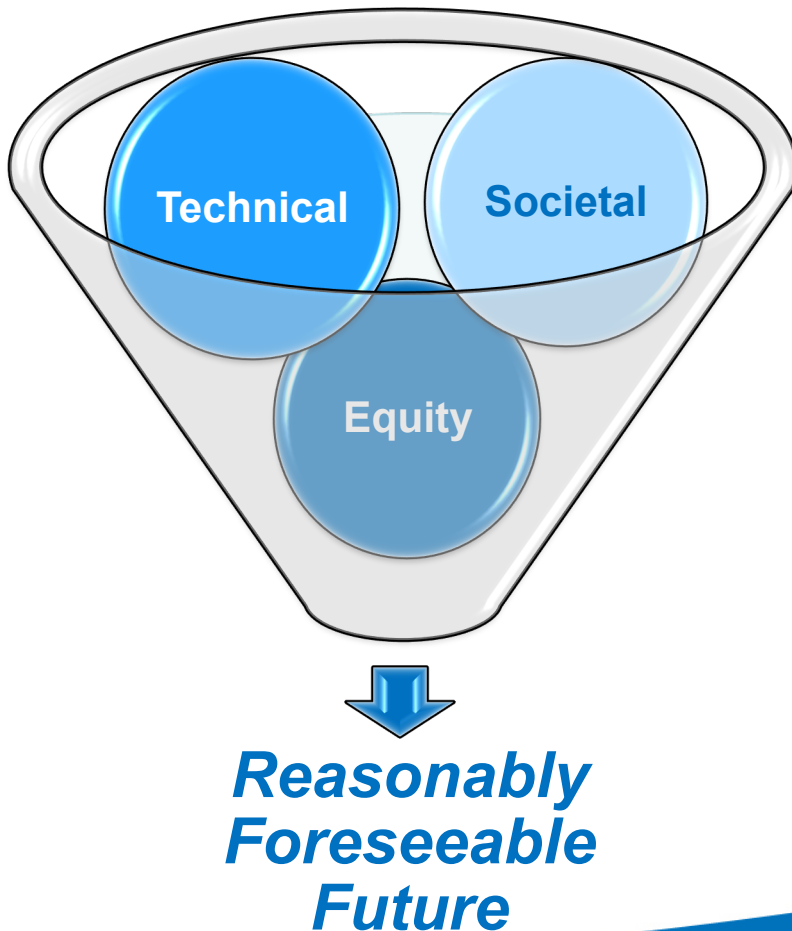


- Consider a two-tiered PoP for analyses:
  - *Tier 1*: Compliance period covering reasonably foreseeable future
  - *Tier 2*: Longer period based on site characteristics and peak dose to a designated receptor

# Period of Performance: *Context*

- Part 61 does not currently specify a PoP
- In response to initial direction, NRC staff developed technical analysis of factors for Commission to consider in selecting PoP<sup>1</sup>
  - Recommended a two-tiered approach

# Tier 1: Compliance Period



- Possible factors
  - ***Societal*** – human activities
  - ***Technical*** – hazard, site characteristics
  - ***Equity*** - inter- and intra-generational
- Fixed, Site-specific, Combo

# Tier 2: Site Characteristics

- Commission identified characteristics for consideration:
  - Waste Package
  - Waste Form
  - Disposal Technology
  - Cover Technology
  - Hydrogeology
- § § 61.50 and 61.51 specify site suitability and design requirements
- Uncertainty in characteristics over time

# Tier 2: Designated Receptor

- Receptor Characteristics
  - Metabolic
  - Behavioral
  - Physical
- Fixed, site-specific, combination
  - Current biosphere

# Tier 2: Performance Metric

- Should NRC consider metrics for a second tier?
- What metrics should NRC consider?
  - Quantitative (Dose, Risk)
  - Qualitative

# Domestic Compliance Period Comparisons

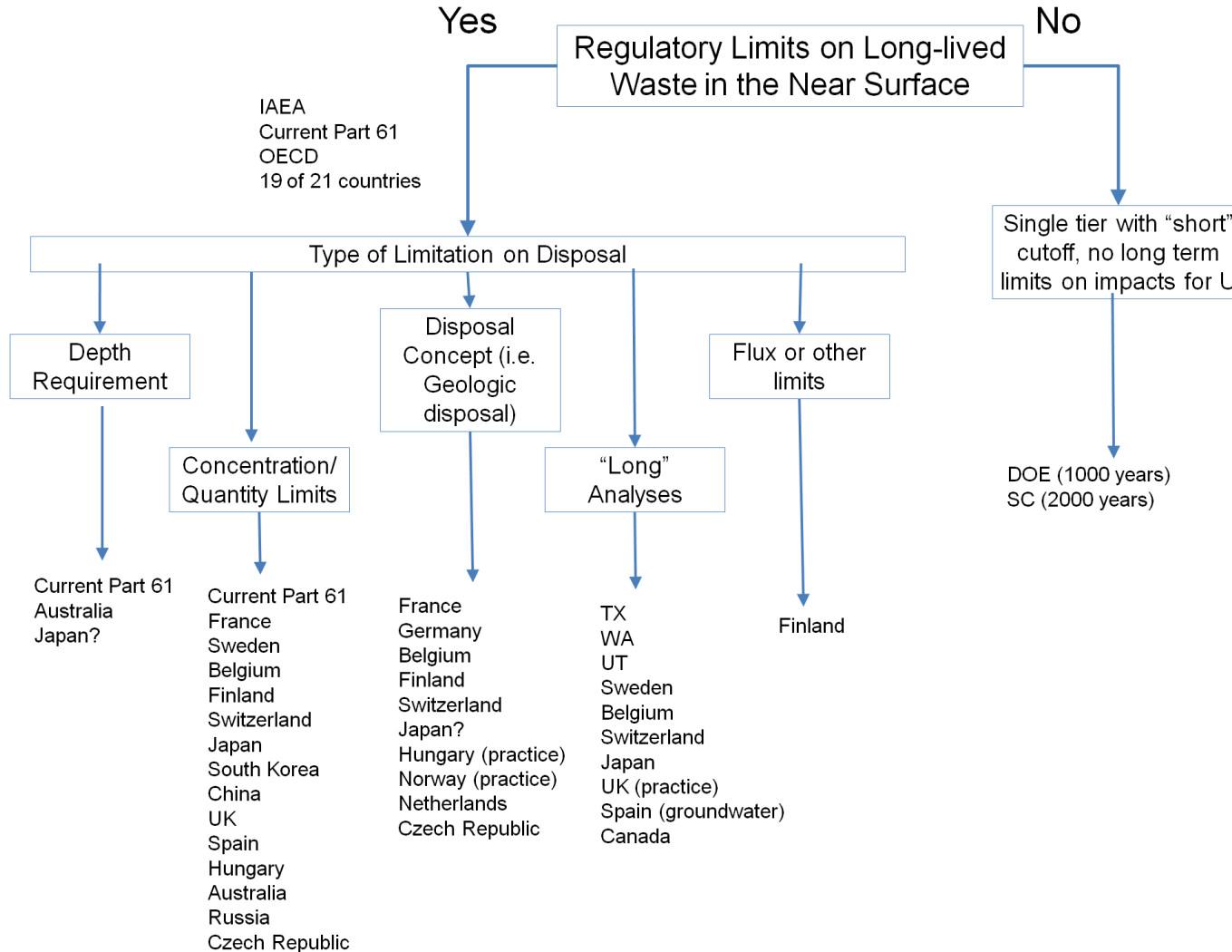
Material	Hazard	Hazard Duration	Action	Compliance Period
EPA RCRA	Chem	∞	Disposal	30+ yrs
Uranium Mill Tailings	Rad	LL	Remediate	200 yrs (<1000 yrs)
Part 20 Decommission Criteria	Rad	VSL	Release	1000 yrs
DOE Order 435.1	Rad	SL	Disposal	1000 yrs
LLW Disposal Facility	Rad	SL	Disposal	[10,000 yrs]
EPA Underground Injection	Chem	∞	Disposal	10,000 yrs
DOE WIR Determinations	Rad	SL-LL	Remediate	DOE: 1000 yrs NRC: 10,000 yrs
DOE Siting Guidelines (10 CFR 960)	Rad	LL	Screening Action	100,000 yrs
EPA HLW/SNF/TRU Generic Standards	Rad	LL	Disposal	10,000 yrs
EPA HLW/SNF Site-Specific Standards	Rad	LL	Disposal	10,000 yrs – 15 mrem 1,000,000 yrs – 100 mrem



# International Approaches

- Almost all countries and organizations set limits on disposal of long-lived waste in the near surface:
  - Concentration/quantity limits
  - Disposal concept (i.e. geologic disposal)
  - “Long” analyses
  - Flux or other limits
  - Depth requirements

# International Approaches



# Period of Performance: *Feedback*

Commission is seeking public feedback on a two-tiered approach:

- Defining a reasonably foreseeable compliance period
- Defining a longer period of performance that is not a *priori*, but developed based on site characteristics and the peak dose to a designated receptor

# Period of Performance: *Feedback*

Commission is seeking public feedback on other approaches that may be used to complement the performance assessment analyses:

- Simplified screening process with option for detailed analyses (e.g. 61.55 and 61.58 analogy)
- Disposal depth and flux limits
- Other requirements

# March 2 Public Meeting (Phoenix): Feedback

- Stakeholder feedback mixed concerning TOC duration (1<sup>st</sup> tier)
  - Support for 1000 years
  - Support for 10,000 years
  - Support for intermediate number between 1000 and 10,000 years
- Consider other performance metrics for 2<sup>nd</sup> tier

# Waste Acceptance Criteria: *Direction*

Commission directed staff to consider flexibility to establish site-specific WAC based on the results of the site's performance assessment and intruder assessment

# Waste Acceptance Criteria: *Context*

- General WAC specified in § § 61.55-61.57
- § 61.58 currently allows requests for alternative waste classification
  - Site-specific exemption
  - Compatibility: H&S (i.e., State adoption not required)
- General WAC only; General or Site-specific; Site-specific only; Other approaches?
- Pros and Cons

# Waste Acceptance Criteria: *Requirements*

- What requirements, if any, should NRC specify?
  - Consistency with technical analyses ( § 61.13)
    - Technical requirements of analyses
  - Waste characteristics
    - Minimum characteristics (e.g., § 61.56(a))
    - Stability requirements (e.g., § 61.56(b))
  - Operational requirements
    - Segregation requirements (e.g., § 61.52(a))
    - Intruder protection requirements (e.g., § 61.52(b))
  - Others? (e.g., criticality, labeling)
- Pros and Cons



# Waste Acceptance Criteria: Guidance

- What guidance would NRC need to develop or revise and why?
  - Technical Position on Waste Classification (1983)
  - Waste Form Technical Position, Rev. 1 (1991)
  - Technical Position on Concentration Averaging and Encapsulation (1995)
  - New Guidance
    - Acceptable approaches for analyses

# Waste Acceptance Criteria: *Feedback*

Commission is seeking public feedback on adding flexibility for disposal facilities to establish site-specific waste acceptance criteria based on the results of the site's performance assessment and intruder assessment

# March 2 Public Meeting (Phoenix): Feedback

Stakeholder support for allowing licensees the flexibility to establish site-specific waste acceptance criteria based on the results of the site's performance assessment and intruder assessment

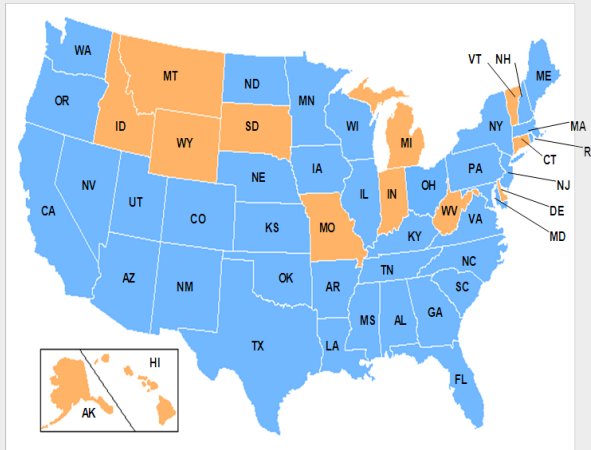
# Compatibility: *Direction*

- Category for the site-specific analyses and site-specific WAC requirements that:
- Ensures alignment between the States and Federal government on safety fundamentals
- Provides States with the flexibility to determine how to implement these requirements

# Compatibility: Context

## THE AGREEMENT STATES

As of October 2011



■ Agreement States (37)  
■ NRC States (13)

- Section 274 of the Atomic Energy Act
- Promote orderly regulatory pattern
- Discontinuation of certain NRC authorities

# Compatibility: Context

- **Essentially Identical Categories**
  - A – Basic standards and related definitions
  - B – Direct trans-boundary implications
- **Essential Objective Categories**
  - C – Required to avoid conflicts, duplications or gaps
  - H&S – Particular health and safety significance
  - States can be more restrictive
- **Other Categories**
  - D – Not required for compatibility
  - NRC – Cannot be relinquished to States

# Compatibility: Feedback

- Commission is seeking public feedback on a compatibility category for the elements of the revised rule that establish:
  - the requirements for site-specific performance assessments and
  - the development of site-specific waste acceptance criteria
- Alignment between States and Federal government on safety fundamentals
- Providing the States with the flexibility to determine how to implement these safety requirements

# March 2 Public Meeting (Phoenix): Feedback

- Stakeholder support mixed
- Concern that compatibility designation should be neutral and not create opportunities for unfair competitive advantage



# Public Feedback

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# Part 61 Emerging Technical Issues

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# Outline

- Background
- Stakeholder Involvement
- Emerging Issues
- March 2 Public Meeting (Phoenix)
- Path Forward

# Stakeholder Involvement

- Public Workshop on BTP (February 2011)
- Public Comment on Updated Volume Reduction Policy Statement (August 2011)
- ACRS Meetings on BTP (October and December 2011)
- Rulemaking Development (DU Workshops 2009, Waste Management 2011)

# Emerging Issues

- Inadvertent Intruder Protection
  - Concept of an inadvertent intruder is flawed
  - Assumption that intrusion will occur is not risk-informed (probability of 1)
  - Need to protect future generations is over emphasized

# Emerging Issues (continued)

- Institutional Control Period
  - Current 100-year duration too short
  - Financial assurance requirements for some states preclude loss of control indefinitely
- Need for a New Environmental Impact Statement
  - Initial assumptions outdated
- Engineered Barrier System
  - Specify performance criteria (or some minimum level of performance)

# Emerging Issues (continued)

- 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’

# Emerging Issues (continued)

- Definitions and Concepts
  - 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



# Emerging Issues (continued)

- Definitions and Concepts
  - 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

# March 2 Public Meeting (Phoenix): Feedback

- Update Waste Classification Tables to Reflect Latest ICRP Dosimetry
  - Regulation needs to rely on current science
- Extend Duration of Institutional Controls
  - Current 100-yr duration appears to be arbitrary

# March 2 Feedback (continued)

- Amend Part 20, Appendix G LLW Manifest Reporting Requirements
  - Certain isotopes currently over-reported owing to minimum detection thresholds
  - Over-reporting artificially inflates actual disposal site inventory
- Develop Disposal Criteria of GTCC LLW and LAW
  - GTCC: Reflects end of Yucca Mountain program
  - LAW: Radiation risk indistinguishable from background

- **Questions for Stakeholders**
  - Should existing Part 61 be revised or left as is?
  - What recommendations do you have for specific changes to the current rule?
  - What are your suggestions for possible new approaches to commercial LLW management?
  
- **Potential Options**
  1. Risk-Inform Part 61 Waste Classification Framework
  2. Comprehensive Revision Option
  3. International Alignment Option
  4. Site-Specific WAC Option
  5. Maintain *Status Quo* Option

# Path Forward

- Engage Stakeholders and Public
  - Gather comments to inform decision-making
  - Facilitate information exchange through web page
  - Docket # **NRC-2011-0012** at [www.regulations.gov](http://www.regulations.gov)
- Report Back to the Commission

# Public Feedback

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# Summary of Stakeholder Comments and Opportunity for Public Exchange

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# Recap and Closing

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Management Programs

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