DOE Update of LLW Standards and Potential Applicability to Part 61 Revisions

U.S. NRC Regulatory Information Conference

Bethesda, MD
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Introduction

- History & Status of DOE Order 435.1, Radioactive Waste Management
- Overview of DOE Order 435.1
- Applicability to Part 61 Revisions

History

- DOE Order 435.1, Radioactive Waste Management, issued July 9, 1999
- Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-2
  - LLW forecasting and capacity planning inadequate
  - Characterization of LLW ineffective
  - LLW in storage indefinitely
  - Storage conditions for LLW inadequate
  - Some LLW generated with no path for disposition
  - Performance assessments unapproved and lacking adequate requirements
- DNFSB 94-2 required DOE to conduct a complex-wide review (CWR)

History (continued)

- CWR, completed May 1996, focused on environmental, safety & health (same basic findings of DNFSB)
- CWR/DNFSB were the primary drivers in developing a new approach to DOE radioactive waste management
  - Incorporate DNFSB recommendations
  - Less prescriptive & more performance based
  - Develop a clear & sound technical basis for requirements/guidance
  - Incorporate considerations of risk through Integrated Safety Management System (ISMS) process

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How 435.1 was Created – Application of the Integrated Safety Management System Approach

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Objectives of 2010 CWR

- Identify progress made within DOE for managing radioactive waste
- Provide a self-assessment tool for sites
- Identify radioactive waste management best practices and areas of improvement at the site and complex-wide
- Support update of DOE O 435.1
- CWR Report available at: http://www.em.doe.gov/Pages/compliance.aspx

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Overall Results – 14,000 Responses

Distribution of CWR Responses
(62 BP/118 AI waste types)

	High Level Waste		TRU Waste		Low Level Waste	
Category	BP	AI	BP	AI	BP	AI
General		1	3	5	2	11
Generation	5	5	1	4	21	17
Treatment		2	1	3	4	2
Storage	2		1		4	3
WIR	1	9				
Closure	2	1				
Disposal			5	2	7	22
Crosscutting		7	1	6	2	16
FEM						2
Total	10	25	12	20	40	73

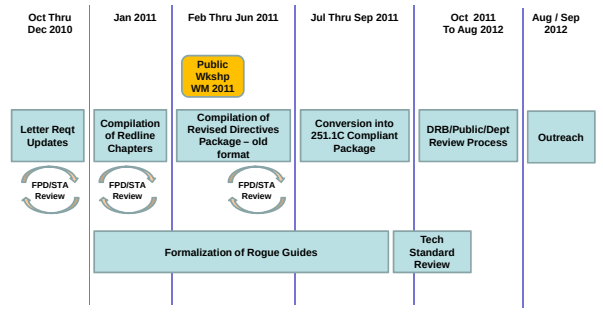
DOE Order 435.1 Update Status

- Updating the Order Based on:
  - Over 11 years experience implementing DOE O435.1
  - Documented feedback through the CWR
    - Best Practices
    - Lessons Learned
  - Interaction with stakeholders
- Established Chapter Specific Core Teams
  - General Requirements – Linda Suttora
  - LLW – Frank DiSanza
  - HLW – Joel Case
  - TRU – J.R. Stroble/Alton Harris

DOE O435.1 Update Status (continued)

- Workshop #1- April 2010 – Portland
  - Established core teams
  - Developed plans and schedules
  - Team assignments
  - Expectations
- Workshop #2 – October 2010 – Salt Lake City
  - Status
  - Crosscutting issues
  - Technical Standards (rogue guides)
  - Team consistency
- Workshop #3 – March 4, 2011 – Phoenix
  - Input from public and user communities

Current Schedule



Overview of DOE Order 435.1

- Four Chapters
  - General Requirements
  - High-Level Waste
  - Transuranic Waste
  - Low-Level Waste
- Waste Type Chapters Provide Basic Requirements for
  - Generation
  - Characterization
  - Certification
  - Treatment
  - Storage
  - Disposal

435.1 Disposal Requirements

- HLW – Nuclear Waste Policy Act
- TRU – WIPP Land Withdrawal Act
- LLW – Site-specific performance assessment
  - Waste Acceptance Criteria
  - Disposal Authorization Statement
    - Performance Assessment
    - Composite Analysis
    - Monitoring Plan
    - Preliminary Closure Plan
    - PA/CA Maintenance Plan
    - Annual Summaries

Site-Specific PA Philosophy

- Safety Case Approach
  - More than just the PA results
- Systems Approach
  - Source term
  - Natural Systems (site characteristics, features, events, and processes)
  - Engineered Systems (Waste form, barriers)
- Expected Case - Realistically Conservative
- Sensitivity and Uncertainty Analyses
  - What is important to model
  - what can we/do we need to learn more about
- Graded and Iterative Approach

What could this mean for Part 61?

- **Case 1 – No Classification System**
  - All Near surface LLW disposal limits based on site-specific PA
- **Pros:**
  - Risk-informed and performance based
  - Emphasizes capabilities of each site
- **Cons:**
  - May meet resistance
  - Distinction between what is and is not generally suitable for shallow land burial is still politically and legally significant (e.g., GTCC)

What could this mean for Part 61?

- **Case 2 – Retain GTCC Limit**
  - Near surface LLW disposal limits based on site-specific PA, up to existing GTCC limits
- **Pros:**
  - Still risk-informed and performance based
  - Emphasizes capabilities of each site, up to existing GTCC limits, therefore preserves political and legal significant concerns
- **Cons:**
  - May still meet resistance

What could this mean for Part 61?

- **Case 3 – Retain Class A, B, C, but base limits on site-specific PA**
  - Concepts of what can be disposed as is (A), with enhanced waste form (B), and requires deeper disposal (C) remain
  - Limits of each class determined site-specifically based on site-specific PA
- **Pros:**
  - Still risk-informed and performance based
  - Emphasizes capabilities of each site
- **Cons:**
  - May be complex to implement

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Lessons Learned about Site-Specific PA

- Site-Specific PA requires additional technical and scientific rigor
  - Documentation and traceability
- Assumptions and parameter selections drive results
  - Documentation and traceability
- Uncertainties must be identified directly and managed
  - PA Maintenance
  - Monitoring
- Graded and Iterative approach
  - Many site-specific PAs will be prepared over life of facility

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