Panel 24 – Risk Informed Regulations for Radioactive Waste Management

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Waste Management Symposia 2014

History

- DOE Order 5820 was written and revised several times in the 1980s. Continuously improved and moved towards greater control over radioactive wastes but increasingly risk-informed
- Defense Nuclear Facilities Safety Board recommended several improvements in 1994
- First Complex-Wide Review conducted
  - Outcome was DOE 435.1 in 1999
- Second Complex-Wide Review conducted in 2010
  - Identify improvements needed based on over 10 years of implementing 435.1
  - Outcome is ongoing revision to Order

DOE Manual 435.1 Overview

- **Four Chapters**
  - General Requirements
  - High Level Waste
  - Transuranic Waste
  - Low Level Waste
- **Requirements for:**
  - Generation
  - Characterization
  - Certification
  - Treatment
  - Storage
  - Disposal

Overview of Revision

- DOE Order specifies new format
  - Standard format for Orders changed – streamlining and no Manual (just Order/guidance)
  - Contractor Requirements Document to identify requirements to include in contracts
- Add new requirements since 1999
  - National Defense Authorization Act for 2005, Section 3116
  - New DOE offices – Legacy Management, new HSS office

Revision Teams

- Established Chapter Specific Core Teams
  - General Requirements – Linda Suttora
  - LLW – Frank DiSanza
  - HLW – Joel Case
  - TRU – J.R. Stroble/Alton Harris
- Teams composed of HQ, DOE Field, Field Contractors

General Requirements

- Clarifying strategic planning
- Strengthening the Radioactive Waste Management Basis
- Clarifying Change control processes
- Added one-touch philosophy
- Clarifying characterization for storage and classification for disposal
- Clarifying uses of consolidating waste (worker safety, efficiency)

High Level Waste

- Improving guidance and examples (primarily waste incidental to reprocessing examples since they now exist)
- Moving non-HLW specific requirements to General Requirements
- Incorporating National Defense Authorization Act for FY 2005 Section 3116
- Deleting references to non-existent DOE Organizations and documents (RW)

Transuranic Waste

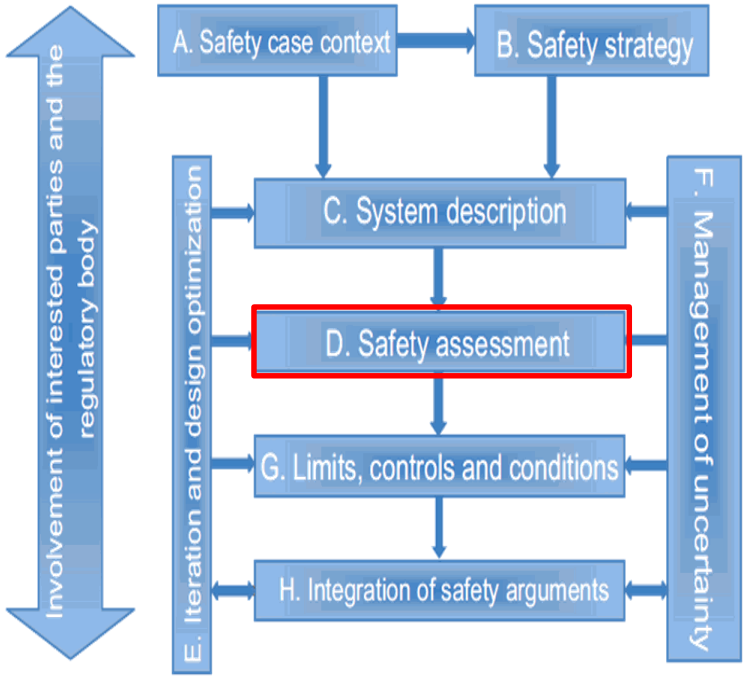
- Improving guidance and examples (packaging and transportation, site TRU certification)
- Moving non-TRU specific requirements to General Requirements
  - Including corrective actions and monitoring

Low Level Waste

- Developing new required Disposal Authorization Statement Technical Standard
- Improving guidance and examples (including guidance on the technical standard)
- DOE has successfully implemented an integrated protection system for near surface disposal for more than 25 years:
  - DOE Radioactive Waste Management Basis (RWMB) is similar to the IAEA Safety Case approach
  - Defense-in-depth and total systems perspective
  - Maintaining consistency with other promulgated Federal requirements for near-surface disposal

Consistent with International Approaches

- Integrated approach to safety using defense-in-depth principles (similar to Safety Case)
- Highlights links among modeling, design and waste acceptance criteria
- Performance Assessments (PAs) are one part of the integrated approach
- Consistency with other regulations for near-surface disposal and consideration of international recommendations



IAEA Safety Case Concept

Technical Standard

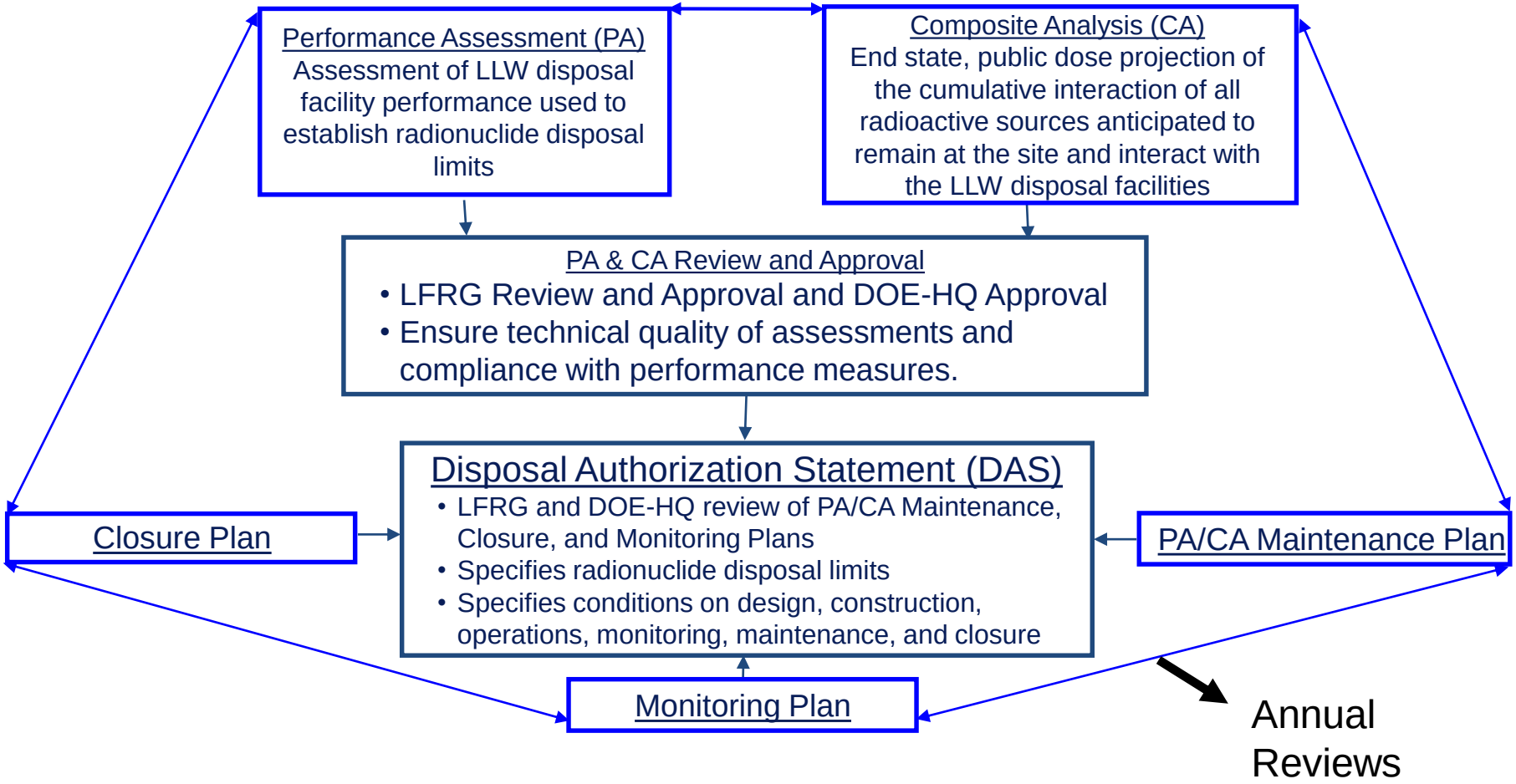
- Will be the core of LLW disposal at USDOE
- Identifies both requirements and guidance for attaining authorization to dispose
- Provides example of best practices and lessons learned
- Clarifies that sites must have a suite of analyses prior to initiating disposal
- Identifies necessary analyses for continued disposal authorization

Technical Standard Contents

- Performance Assessment
- Composite Analysis (CA)
- Waste Acceptance Criteria
- Monitoring
- Maintenance (management of uncertainties throughout the process – R&D, Testing)
- Closure (pre and post closure)
- Unreviewed Disposal (or CA) Question Evaluation and Special Analysis
- Annual Summaries

RWMB Requirement for a LLW Disposal Facility

An Integrated & Iterative Regulatory Framework



Risk-Informed, Performance Based Regulatory Basis

Next Steps

- Complete Headquarters review
- Field review (DOE and contractor implementers)
- Public review – 60 days (notice in Federal Register)
- Revise per public comments
- Input into DOE Order process
- Issue and Implement