
DOE/NRC Public Workshop

Updates to DOE's Radioactive Waste Management Order

March 4, 2011

Phoenix, AZ



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Introduction

- History
- 2010 Complex-Wide Review
- DOE O 435.1 Revision Update

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and by:

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Project Team Lead - DOE Order 435.1
Update



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History

- DOE O 5820.2A, *Radioactive Waste Management*, was issued September 1988
 - Several attempts to revise DOE O 5820.2A
- 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

- 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 radioactive waste management
- DOE decide to replaced DOE O 5820.2A with DOE O 435.1
 - Incorporate DNFSB recommendations
 - Develop a clear & sound technical basis for requirements/guidance
 - Incorporate considerations of risk through ISMS process
 - Less prescriptive & more performance based
 - Address stakeholder concerns
 - Other considerations (e.g. delegation of decision making to the field)

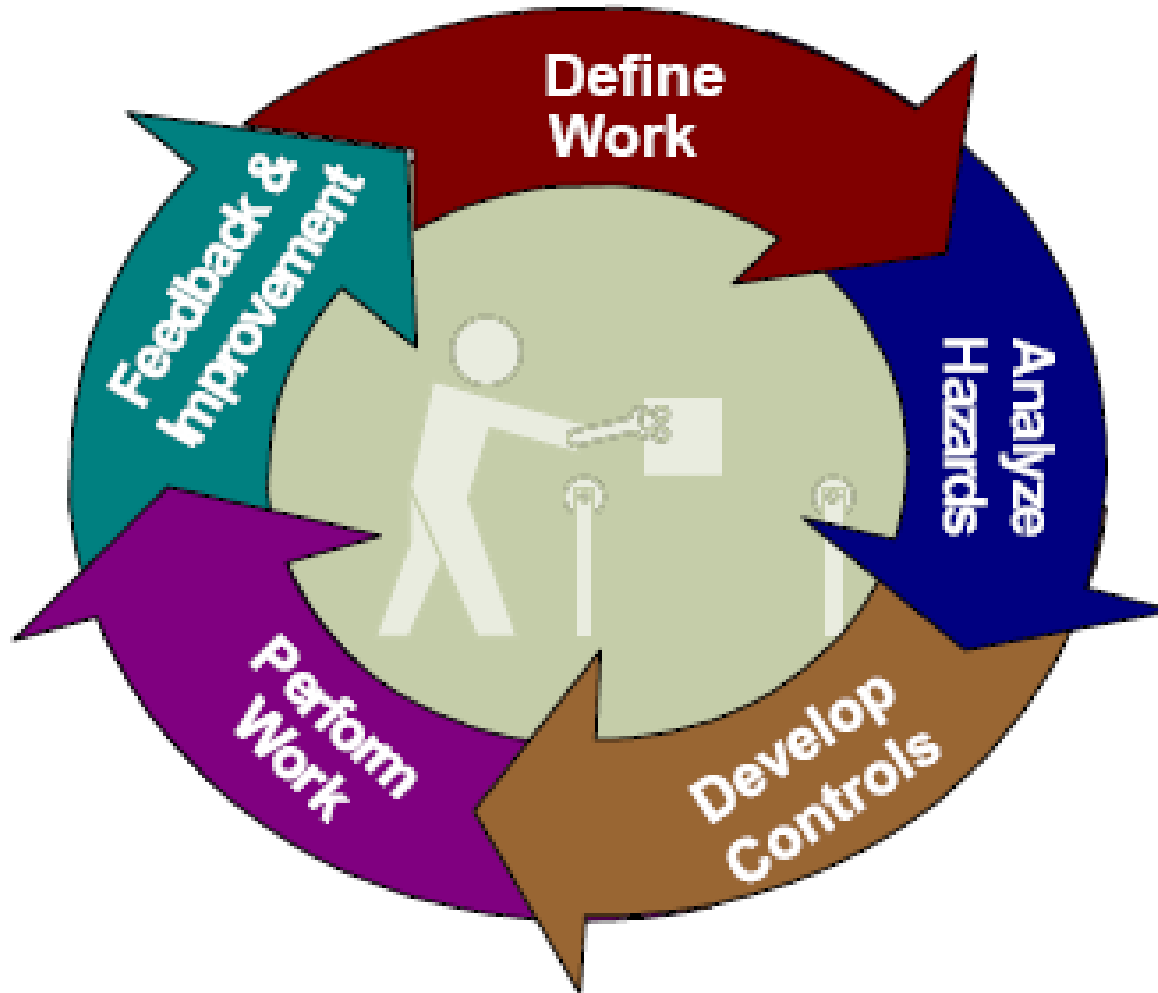


History - How 435.1 was Created

- Began Order writing process September 1996
- Four teams of Headquarters and Field staff
 - General Requirements, HLW, TRU, & LLW/MLLW
- Structured ISMS process
- July 9, 1999 issued Order, Manual, Guidance, Technical Basis, and training program



Integrated Safety Management System Process



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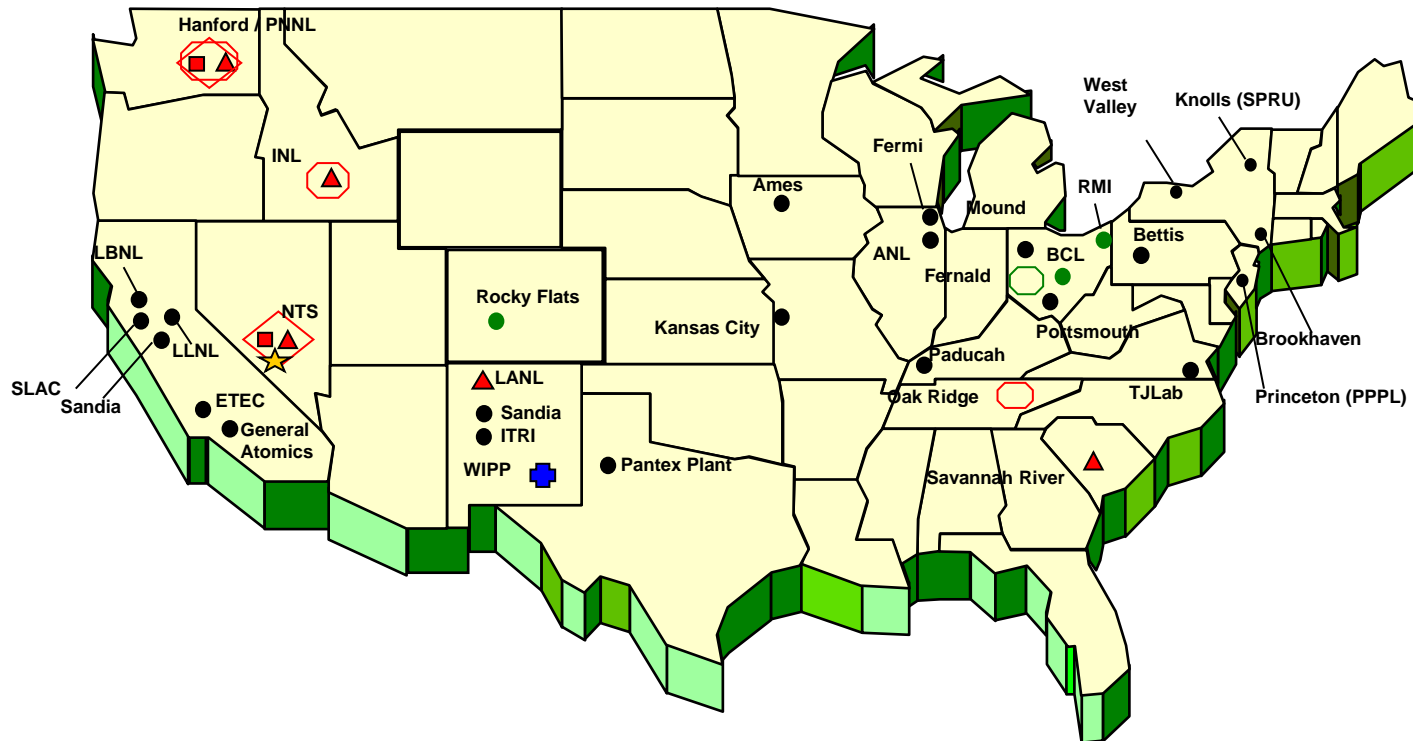
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Objectives of 2010 CWR

- Describe the progress made within EM/NNSA for managing radioactive waste (HQ, HLW, TRU, LLW)
- 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



DOE Radioactive Waste Management Complex



Sites – 29 LLW, 12 TRU, 4 HLW
PSO – EM, NE, SC, HS, LM & NNSA



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Overall Results – 14,000 Responses

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

<u>Category</u>	High Level Waste		TRU Waste		Low Level Waste	
	<u>BP</u>	<u>AI</u>	<u>BP</u>	<u>AI</u>	<u>BP</u>	<u>AI</u>
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



Key Findings/Issues – Executive Summary

1. Significant progress has been made in radioactive waste management over the last 10 years
2. Establishing LFRG has improved consistency in PA/CA reviews
3. New requirements (e.g. NDAA 3116 for tank closures) should be included in the DOE O435.1 update
4. Identification of disposal paths for certain waste with no path for disposal (e.g. non-defense TRU)



Key Findings/Issues – Executive Summary

5. Clarifying definitions for: fission products in sufficient concentrations; classified material and spent nuclear fuel reprocessing in DOE O435.1
6. Improving Program Office and Site Managers oversight responsibilities and consistent implementation of requirements involving multiply site contractors and/or program offices
7. Improved implementation of other DOE Orders (e.g. classified material) and outside regulatory agencies (e.g. RCRA, CERCLA) requirements that have overlapping requirements with DOE O435.1
8. Modify the current commercial disposal exemption process requirements for LLW



DOE O435.1 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

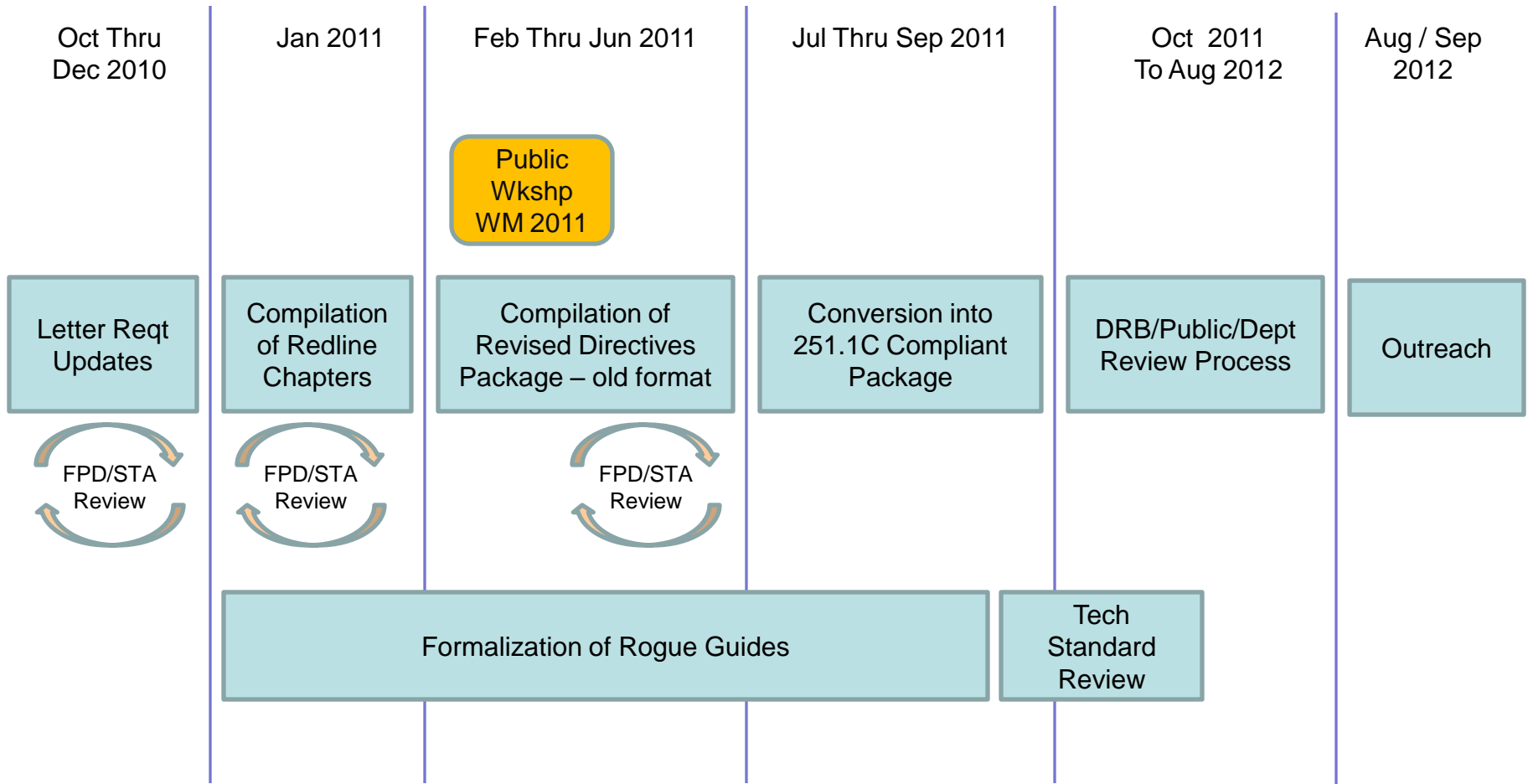


DOE O435.1 Update Status

- 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

- 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



General Requirements - Core Team

Presented by:

Linda Suttora

Office of Environmental Compliance, EM-41

Headquarters, Germantown, MD

Department of Energy

General Requirements Team Lead - DOE Order 435.1 Update



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General Requirements – CWR Inputs / Recommended Changes

Recommendations from CWR and others:

- DOE O 251.1C (order on orders) required streamlining
- Contractor Requirements Document
 - Can't discuss requirements from other regulations or Orders
- Add new requirements
 - NDAA Section 3116
 - Recognition of new offices (legacy management)
- Avoid duplication
 - Consolidating -- Cross-cutting requirements moved to General Requirements



General Requirements – CWR Inputs / Recommended Changes (continued)

- Strategic planning (Complex-wide, HQ Program Office, Site-wide), clarification
- Oversight
- Communication and Field Manager responsibilities
- Change control
- One-touch philosophy



General Requirements – CWR Inputs / Recommended Changes (continued)

- Strengthen Radioactive Waste Management Basis
 - Pre-generation planning (waste with no path to disposal)
 - Generation (characterization for meeting TS WAC, blending for safety and future disposal, data management, classified materials)
 - Treatment
 - Storage
 - Disposal (final classification for disposal WAC, non-DOE radioactive wastes, Section 3116)
- Unreviewed Waste Management Question Evaluation



General Requirements – CWR Inputs / Recommended Changes (continued)

- Off-site Disposal Exemption Eliminated
 - Requirement for cost-benefit analysis guidance provided
 - Responsibility for State notification of offsite shipments, audits of off-site facility
- Future Long term Stewardship Planning recognizing the needs of the Office of Legacy Management
 - Institutional Controls
 - Protecting assumptions from PA/CA
 - Monitoring plans
 - Human intrusion



HLW Core Team

Presented by Marty Letourneau for:

Joel Case, Facility and Material Disposition

Office of Nuclear Energy

Idaho Field Office

Department of Energy

HLW Team Lead - DOE Order 435.1 Update



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HLW Core Team - CWR Inputs

DOE O 435.1 Update should:

- Develop revisions to waste incidental to reprocessing (WIR) citation procedures to enable sites to safely disposition equipment that previously came into contact with HLW.
- Incorporate the process for tank closure under the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 Section 3116 (NDAA 3116).
- Recognize success of early interaction with regulators and stakeholders as seen in the scoping meetings conducted as part of NDAA 3116 implementation at Savannah River and Hanford.
- Improve definitions of LLW, HLW, and TRU so that they are not based on pedigree.
- Clarify requirements for alternative HLW final waste forms (other than glass).



HLW Core Team – General Approach

- **Review existing Manual (Chapter II) to determine what requirements could be eliminated or consolidated in General Requirements (Chapter I)**
- **Assign Letter Packages to Subject Matter Experts**
- **Review proposed changes as a group and resolve comments**
- **Revise Guide and Technical Basis to be consistent with requirements**
- **Submit revised Manual, Guide, Technical Basis to FPD for review**



HLW Core Team – Specific Changes

- **Some existing requirements moved to General Requirements (Chapter I)**
 - Complex Wide Management Program
 - Radioactive Waste Management Basis
 - Contingency Actions
 - Waste Generation Planning
- **The definition of HLW was made consistent with the Nuclear Waste Policy Act of 1982.**
 - Also included sub-definitions for key terminology in the HLW definition such as: “Highly radioactive”, “Sufficient Concentrations”, “Reprocessing”, “Permanent Isolation”



HLW Core Team – Specific Changes (continued)

- **NDAA 3116 process included as an option for determination of Waste Incidental to Reprocessing.**
- **Various updates to the WIR citation process.**
- **References to the Office of Civilian Radioactive Waste Management have been deleted, and responsibility for associated documents (e.g., WAPS, WASRD, QARD) reassigned to the cognizant DOE authority.**
- **Disposal of HLW waste remains an issue that must be addressed through separate policy (i.e., not part of DOE O 435.1 Update).**



TRU Core Team

Presented by:

J. R. Stroble, Director
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TRU Team Lead - DOE Order 435.1 Update



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TRU Core Team - CWR Inputs

DOE O 435.1 Update should:

- Provide sufficient information for the generation and disposal of classified TRU waste
- Address the impacts of “Work for Others” programs when work scope for non-DOE defense related programs could produce TRU waste
- Include packaging instructions for both contact- and remote-handled TRU to reduce need for re-work and remediation
- Address the need for treatment facilities to be provided for problematic waste streams (e.g., bulk liquids; CH waste items too large to fit into a 55-gallon drum; corrosive, reactive, or ignitable waste; high-fissile gram equivalent waste; high hydrogen gas concentration waste)



TRU Core Team - CWR Inputs (continued)

DOE O 435.1 Update should:

- Address requirements for a quality records program for all records detailing history of a waste stream, processes used to generate the waste, facilities in which the waste was generated, and any information that may be needed to be used in an Acceptable Knowledge program
- Define the requirements of minimum detection limits of assay systems so the disposition of waste as either TRU or LLW is clear
- Identify the “Once-Through” or “One-Touch” philosophy that stipulates that at the point of generation waste will be packaged, categorized, and characterized in full compliance with its disposition pathway
- Clarify when Treatment requirements from DOE Order 435.1 apply



TRU Core Team - General Approach

- Review existing Manual (Chapter III) to determine what requirements could be eliminated/consolidated in General Requirements (Chapter I)
- Assign Letter Packages to Subject Matter Experts
- Propose changes to TRU Core Team Steering Panel
- Revise Guide and Technical Basis to be consistent with requirements
- Submit revised Manual, Guide, Technical Basis to FPD for review



TRU Core Team - Specific Changes

- Some existing requirements moved to General Requirement (Chapter I)
 - Complex Wide Management Program
 - Radioactive Waste Management Basis
 - Contingency Actions
 - Waste Generation Planning
- Two requirements eliminated
 - Corrective Actions
 - Monitoring (this is now handled in General Requirements update)



TRU Core Team - Specific Changes (continued)

- Examples of updates to TRU chapter:
 - Remote- and Contact-Handled TRU Waste Packaging Instructions will be referenced for required use in the revised Order. The instructions are currently in the Directives Review Board process as a DOE Notice
 - Once-Through philosophy added in multiple locations of the TRU chapter
 - Updated Management of Specific Wastes requirement to address classified TRU waste
 - Removed erroneous examples from the Manual.



LLW Core Team

Presented by:

Frank Di Sanza, Supervisory General Engineer

EM-50.2

Nevada National Security Site – Small Sites Office

Department of Energy

LLW Team Lead - DOE Order 435.1 Update



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LLW Core Team - CWR Inputs

DOE O 435.1 Update should:

- Include language on the appropriate use of concentration averaging.
- Include the use of probabilistic modeling (including performance objectives) and analysis and provide guidance for the conduct and interpretation of PA sensitivity and uncertainty analysis.
- Address CERCLA and Federal Facility Act closure as a possible alternative (similar to tank farm closure).



LLW Core Team - CWR Inputs (continued)

DOE O 435.1 Update should:

- Clarify the expectations regarding the use of liners for disposal facilities.
- Address the exemption process for use of commercial treatment, storage and disposal facilities.
- Include language related to the use of the Unreviewed Disposal Question Evaluation procedure for determining the impact to the PA/CA when proposed actions or new information is discovered provides a valid approach for evaluating off-normal events and conditions against performance objectives.



LLW Core Team - General Approach

- Review existing Manual (Chapter IV) to determine what requirement could be eliminated or put in General Requirements (Chapter I)
- Discuss potential changes within small Letter Groups
- Propose changes to LLW Core Team Steering Group
- Revise Guide and Technical Basis to match requirements
- Submit revised Manual, Guide, Technical Basis to FPD for review
- Decision made to prepare a LLW Technical Standard to address existing unofficial guidance



LLW Core Team - Specific Changes

- Some existing requirements moved to General Requirement (Chapter I)
 - Use of concentration averaging
 - Exemption process
- Examples of new requirements:
 - For analyses performed probabilistically, the peak of the mean or median of the results distribution, whichever is higher, shall be used to assess compliance with the performance objectives
 - The PA shall include a sensitivity/uncertainty analysis, which shall include an assessment of peak impact within a period of 10,000 years. If the peak impact is not realized within 10,000 years, a qualitative assessment shall be performed from 10,000 years to the peak impact.



LLW Core Team - Specific Changes (continued)

- Examples of new requirements (continued):
 - Approval of the DAS is based on the review and approval of the following documents:
 - Unreviewed Disposal Question Evaluation (UDQE). A process that provides and documents a method to evaluate new information obtained through discoveries, research and development, etc to the PA/CA.
 - System Evaluation (SE) (new facilities only). An evaluation that provides a holistic evaluation of natural and engineered barriers and their effectiveness as a unit.



DOE/NRC Public Workshop

March 4, 2011 Phoenix, AZ

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The recorded morning (DOE) and afternoon (NRC) audio/video workshop webcast, and the transcript will be located at the DOE Environmental Management web page above.



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