DOE/EM-0002

Feedback/Improvement

2010 Complex Wide Review/Update DOE O 435.1

Define Scope of Work

1996 Complex-Wide Review

Analyze Hazards

Develop Hazard Controls

Issue DOE O 435.1 (1999)

Complex-Wide Review of DOE'S RADIOACTIVE WASTE MANAGEMENT

EM Environmental Management
safety ◆ performance ◆ cleanup ◆ closure

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Complex-Wide Review of DOE's Radioactive Waste Management Summary Report

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Acronyms

AB	Authorization Basis
AEA	Atomic Energy Act
ALARA	As Low As Reasonably Achievable
ARAR	Applicable or Relevant and Appropriate Requirement
CA	Composite Analysis
CBFO	Carlsbad Field Office
CCP	Central Characterization Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	Contact-handled
CID	Central Internet Database
CWR	Complex-Wide Review
D&D	Decontamination and Decommissioning
DAS	Disposal Authorization Statements
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOT	Department of Transportation
DSA	Documented Safety Analysis
EFCOG	Energy Facility Contractors Group
EH	Office of Environmental, Safety and Health
EM	Office of Environmental Management
EPA	Environmental Protection Agency
FEM	Field Element Managers
HLW	High Level Radioactive Waste
HQ	DOE Headquarters
HSS	Office of Health, Safety and Security
INL	Idaho National Laboratory
ISMS	Integrated Safety Management System
LAW	Low Activity Waste
LFRG	Low Level Waste Disposal Facility Federal Review Group
LLW	Low Level Radioactive Waste
LLWCB	Low Level Waste Corporate Board

LOIs	Lines of Inquiry
LM	Office of Legacy Management
LTS&M	Long-Term Surveillance & Maintenance
MLLW	Mixed Low Level Waste
M&O	Management and Operating
NDA	Non-destructive Assay
NDAA 3116	Ronald Reagan National Defense Authorization Act of 2005 Section 3116
NDE	Non-destructive Examination
NE	Office of Nuclear Energy
NEPA	National Environmental Policy Act of 1969
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
NTP	National Transuranic Waste Program
NTS	Nevada Test Site
NWPA	Nuclear Waste Policy Act
PA	Performance Assessment
POC	Points of Contact
RCRA	Resource Conservation and Recovery Act
R&D	Research and Development
RH	Remote-Handled
ROD	Record of Decision
RTR	Real Time Radiography
SC	Office of Science
SNF	Spent Nuclear Fuel
SRS	Savannah River Site
SSA	Security and Safety Performance Assurance
TRU	Transuranic Radioactive Waste
TRUPACT	Transuranic Waste Package Transporter
TSCA	Toxics Substances Control Act
TSDF	Treatment, Storage, and Disposal Facilities
TWPC	Transuranic Waste Processing Center
UDQE	Unreviewed Disposal Question Evaluation
WAC	Waste Acceptance Criteria

WFO	Work for Others
WIMS	Waste Information Management System
WIPP	Waste Isolation Pilot Plant
WIR	Waste Incidental to Reprocessing
WM PEIS	Waste Management Programmatic Environmental Impact Statement
WVDP	West Valley Demonstration Project

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Complex-Wide Review of DOE's Radioactive Waste Management

2010 Executive Summary

Background

The Department of Energy (DOE) conducted a comprehensive complex-wide review of its radioactive waste management activities associated with implementation of the requirements of DOE Order 435.1, Radioactive Waste Management, and its associated Manual and Guides. The review was designed to gather feedback on the effectiveness of the DOE Order 435.1 requirements, not to assess compliance with the requirements. The complex-wide review examined activities associated with the management of high level waste, transuranic waste, and low level waste, including the radioactive component of mixed low level waste. A similar complex-wide review of environment, safety, and health vulnerabilities associated with low level waste management was conducted in 1996 in response to the Defense Nuclear Facilities Safety Board Recommendation 94-2, *Conformance with Safety Standards at DOE Low-Level Nuclear Waste and Disposal Sites*. The results of the earlier review provided much of the basis for the requirements of the current DOE Order 435.1.

Goals and Objectives

The main goal of this complex-wide review was to obtain feedback from DOE sites and Headquarters Program Offices on the effectiveness and workability of DOE Order 435.1 and its associated Manual and Guides as the Office of Environmental Management (EM) moves forward in updating the Order to ensure its continued protection of the public, workers, and the environment. Three supporting objectives of the complex-wide review included:

1. Documenting progress in radioactive waste management, including resolution of the low level waste vulnerabilities identified by the 1996 review;
2. Providing a self-assessment tool for evaluation and improvement of site and Program Offices' radioactive waste management activities; and
3. Compiling the complex-wide successes, best practices, lessons learned, and areas of improvement associated with implementing the DOE Order 435.1 requirements, for use in updating DOE Order 435.1 and its associated requirements and guides.

Process

The complex-wide review was conducted using four core teams covering high level waste, low level waste and transuranic waste and the DOE Headquarters Program Offices (See Appendix C). The core teams consisted of Federal and contractor personnel with experience in radioactive waste management. Each team developed lines of inquiry addressing its respective areas of review. Responses to the lines of inquiry were prepared by points of contact for each field site and Headquarters organization. The Energy Facility Contractors Group and waste type corporate boards chartered by the Office of Environmental Management were instrumental in the identification of points of contact and in enhancing participation in the complex-wide review. To encourage more thorough responses, the core teams conducted onsite visits for larger sites and interviewed key individuals by telephone or in-person for smaller sites. The core

teams evaluated responses received and consolidated them into either best practices or areas of improvement. Following completion of the review by the core team, a board of experienced senior consultants (Appendix C) provided an independent review of the findings of the complex wide review and the planned update of DOE Order 435.1. Their comments were incorporated into this report.

Results

An analysis of the trends and fundamental common issues reflecting the complex-wide DOE radioactive waste management culture was conducted as a critical element and the most significant issues were identified for each area of review. A total of 68 best practices and 139 areas of improvement were identified by the waste type core teams through the complex-wide review process. Several significant issues identified include:

1. DOE has made significant progress in its radioactive waste management activities since the issuance of DOE Order 435.1. DOE Order 435.1 has been effective in addressing the major vulnerabilities in the Department's management of low level radioactive waste identified by the 1996 complex-wide review. The Order identified clear lines of responsibility between Headquarters and Field Element Managers and provided requirements for the treatment, storage and disposal of high level radioactive waste, transuranic waste and low level radioactive waste. Implementation requirements and guidance were described effectively through the DOE Manual 435.1 and DOE Guide 435.1. Through the implementation of DOE Order 435.1, DOE continues to reduce risk to the workers, the environment and to the public by reducing the amount of waste in storage, treating waste to meet disposal requirements, and disposing of waste in a timely manner.
2. Establishment of the Low Level Waste Disposal Facility Federal Review Group and its manual and guidance has improved consistency with implementing LLW disposal requirements of DOE Order 435.1.
3. New requirements that have emerged since 1999 must be incorporated. For example, the process for tank closure under the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 Section 3116 must be incorporated in a revised DOE Order 435.1.
4. Improvements are needed in the definition of certain radioactive wastes so that they are not based on pedigree. For example, the revised DOE Order 435.1 should identify a disposition path for non-defense transuranic. Currently, only defense transuranic waste can be disposed at the Waste Isolation Pilot Plant. DOE estimates up to 2,700 cubic meters of non-defense transuranic waste have no disposition path.
5. Revisions to certain definitions of radioactive materials and waste could improve implementation of the DOE Order 435.1. Examples of improved definitions aiding in implementation of the Order are "classified material," "fission products in sufficient concentration," and "spent nuclear fuel reprocessing."
6. Implementation of oversight responsibilities under DOE Order 435.1 has been conducted inconsistently by the Program Offices and the Field Element Managers. While certain laboratory oversight responsibilities have become part of the DOE Consolidated Audit Program and this has emerged as an example of a cost-effective

program which improves consistency, additional guidance is required for other oversight areas. In addition, there is a need for consistent implementation of radioactive waste management requirements for those sites that have multiple contractors and Field Offices which have multiple Program Offices with competing missions.

7. Improved coordination is needed between DOE Order 435.1 requirements and other DOE Orders (such as those addressing management of classified materials) and between DOE Order 435.1 and external requirements (such as the Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; Toxics Substances Control Act; 40 CF Part 191; National Environmental Policy Act; and 10 CFR Part 61).

8. Modification of the current commercial exemption requirements for disposal of low level waste. DOE sites should be required to complete meaningful analyses for their disposal decisions, such that the disposal option chosen is most cost-effective and conforms to shipping schedules, but not be required to apply for an exemption. This assumes a well maintained complex-wide waste management program exists along with clarified guidance on conducting the cost-benefit analyses.

Path Forward

As a result of this analysis, the complex-wide review team recommends that DOE O 435.1 be revised to incorporate the best practices and areas for improvement identified by Federal and contractor staff in the review. Items not appropriate for incorporation into the Order or Guidance revisions will be provided to DOE upper management and relevant waste-type corporate boards and steering groups.

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1.0 Overview of the Complex-Wide Review

1.1 Introduction

The United States Department of Energy (DOE) conducted a complex-wide review (CWR) of the radioactive waste management activities associated with implementation of the requirements in DOE Order 435.1 Radioactive Waste Management, (DOE O 435.1), and its associated Manual (DOE M 435.1-1) and Guides. In January 2009, DOE initiated the CWR project to obtain feedback from the many users of DOE O 435.1. The review was designed to gather feedback on the effectiveness of the DOE O 435.1 requirements, not assess compliance with the requirements. The CWR examined activities associated with the management of low level waste (LLW), including the radioactive portion of mixed low level waste (MLLW), high level waste (HLW), and transuranic waste (TRU) to identify successes, best practices, lessons learned, and areas of improvement. This review included the evaluation of the generation, treatment, storage, closure, and disposal activities and the responsibilities of the various Program Offices and Field Element Managers (FEM), as they apply to the management of radioactive waste. Twenty-nine sites manage LLW, 12 sites manage TRU, and 4 sites manage HLW. All of these sites provided responses to this CWR, as well as the 5 Program Offices (which includes National Nuclear Security Administration (NNSA)) with waste management responsibilities and 1 Support Office. Throughout this report, reference to DOE O 435.1 includes its associated Manual and Guides, unless otherwise indicated.

1.2 Goal and Objectives

The main goal of this CWR was to obtain feedback from DOE site and Headquarters (HQ) Program Offices on the effectiveness and workability of DOE O 435.1 as the Office of Environmental Management (EM) moves forward in updating DOE O 435.1 to ensure its continued protection of the public, workers, and the environment. Three supporting objectives of the CWR include:

1. Documenting progress in radioactive waste management, including the resolution of the LLW vulnerabilities identified in the 1996 CWR;
2. Providing a self-assessment tool for evaluation and improvement of site and Program Offices' radioactive waste management activities; and
3. Compiling the complex-wide successes, best practices, lessons learned, and areas of improvement associated with implementing the DOE O 435.1 requirements for use in updating DOE O 435.1 and its associated requirements and guides.

1.3 Background

DOE performed the first CWR in 1996 in response to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-2, *Conformance with Safety Standards at DOE Low-Level Nuclear Waste and Disposal Sites*. The 1996 CWR scope included the evaluation of LLW waste management activities at 36 sites across the DOE complex. The goal was to identify both programmatic and physical vulnerabilities that could lead to unnecessary radiation exposure of workers or the public or unnecessary releases of radioactive materials to the environment. The

1996 CWR identified six complex-wide LLW management vulnerabilities (see text box) that contributed to the development of DOE O 435.1, Radioactive Waste Management. DOE O 435.1 was implemented in July 1999 and became the new standard for managing radioactive waste within the Department. The Department has performed its radioactive waste management activities to DOE O 435.1 requirements for approximately ten years. DOE executed this 2010 CWR to obtain feedback from DOE sites and HQ Program Offices on the effectiveness and workability of DOE O 435.1 to assist EM in determining the need to update DOE O 435.1 and to ensure its continued protection of the public, workers, and the environment. This 2010 CWR includes an evaluation of the vulnerabilities that were identified in the 1996 CWR and describes the progress DOE has made in the management of radioactive waste since the 1996 CWR. This CWR also fulfills the information gathering phase for potential updates to DOE O 435.1.

The six complex-wide LLW management vulnerabilities identified through the 1996 CWR process:

1) LLW forecasting and capacity planning was inadequate;
2) Characterization of LLW was ineffective;
3) LLW that had an identified path forward for disposal remained in storage;
4) Storage conditions for LLW were inadequate;
5) Some LLW had no technical path forward for disposition; and
6) Performance assessments were unapproved and lacked adequate requirements.

Also, in 1996, DOE adopted the Integrated Safety Management System (ISMS) process through DOE M 450.4-1. ISMS is defined as "A safety management system that provides a formal, organized process whereby people plan, perform, assess, and improve the safe conduct of work efficiently and in a manner that ensures protection of workers, the public, and the environment." ISMS has five basic safety core functions: 1) define scope; 2) analyze hazards; 3) develop and implement hazard controls; 4) perform work within controls; and 5) provide feedback and continuous improvement.

DOE applied the ISMS process to the development of DOE O 435.1 by identifying waste management functions and activities based on standard systems engineering approaches; assessing hazards to workers, public, and the environment associated with performing waste management functions and activities; developing controls through the preparation of DOE O 435.1; and implementing those controls through the use of DOE O 435.1 over the past ten years. The preparation of this CWR of waste management activities completes the ISMS cycle with respect to obtaining feedback from implementation of the Department's waste management activities and prepares the Department to update its radioactive waste management requirements in DOE O 435.1.

1.4 Scope

During the ten years that DOE has been implementing DOE O 435.1, the national and international management of radioactive waste has evolved within the Federal and commercial communities. In addition, users of DOE O 435.1 have provided feedback that indicates improvements in the requirements and guidance would be beneficial. This CWR provided a formal method, through the use of lines of inquiry (LOIs), to capture the user feedback across the DOE complex and to identify the best practices and areas of improvement in managing radioactive waste.

The CWR scope included
6 Program Offices,
4 sites for HLW,
12 sites for TRU, and
29 sites for LLW.

The scope of the CWR included the development of LOIs that were based on DOE M 435.1 radioactive waste management requirements for LLW, TRU, HLW, FEM and DOE HQ. Complex-wide vulnerabilities, recommendations and the general approach of the 1996 CWR were used as additional inputs. LOIs were developed using these requirements and the inputs from waste types and the HQ LOIs to acquire the needed information.

The waste-type LOIs were divided into sections as depicted in Table 1.1. The HQ LOIs were divided by Program Office as depicted in Table 1.2. The CWR solicited responses from the sites and DOE Program Offices, see Figure 1.1, that have radioactive waste management responsibilities in the generation, treatment, storage and/or disposal of LLW, HLW, and/or TRU. The sites and offices which participated in the CWR are listed in Table 1.3 below.

Table 1.1: Site LOIs Development

Site CWR Lines of Inquiry Category Breakdown Table				
	Number of questions per LOIs category			
Waste Process Category	**HLW Management LOIs**	**TRU Waste Management LOIs**	**LLW Management LOIs**	**DOE Management Responsibility LOIs**
General	17	20	16	
Generation	43	62	57	
Treatment	34	42	47	
Storage	54	41	52	
Disposal / WIR	14	67	91	
Closure	27			
Crosscutting Areas	31	29	29	
Field Element Manager (Site)				52

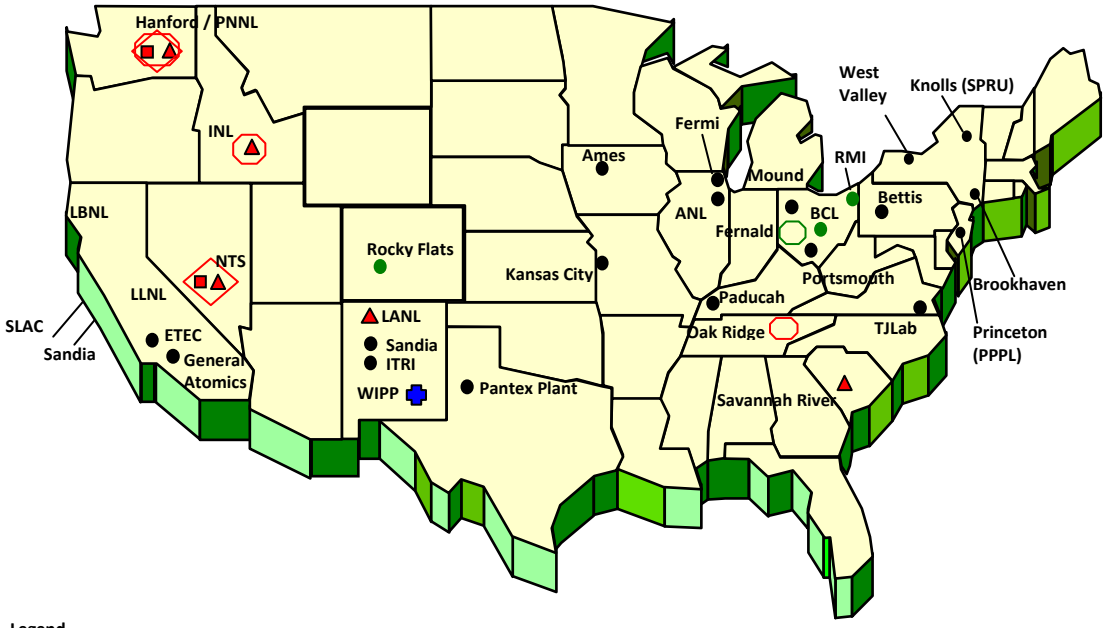
Table 1.2: HQ LOIs Development

HQ CWR Lines of Inquiry Breakdown Table	
DOE HQ Office	**Management Responsibility Category*** (Number of questions)
Environmental Management (EM) Program Office	35
Health, Safety & Security (HSS) Support Office	15
Legacy Management (LM) Program Office	13
National Nuclear Security Administration (NNSA)	13
Nuclear Energy (NE) Program Office	13
Science (SC) Program Office	13

*Note: A review of the 1996 LLW vulnerabilities was added to the HQ LOIs.

Figure 1.1: Map of DOE's Radioactive Waste Management Complex

DOE's Radioactive Waste Management Complex



Legend

- DOE Generator Site (no onsite disposal facility)
- CERCLA Disposal Facility
- Sites are closed
- LLW Operations Disposal Facility
- MLLW Operations Disposal Facility
- Regional LLW Disposal Facility
- Waste Isolation Pilot Plant (WIPP) for TRU disposal

DOE Waste Management Policy:

LLW and MLLW: If practical, disposal on the site at which it is generated. If onsite disposal not available, at another DOE disposal facility. At commercial disposal facilities if compliant, cost-effective, and in best interest of the Department

TRU waste: If defense, disposed at Waste Isolation Pilot Plant, New Mexico. If non-defense, safe storage awaiting future disposition

HLW and SNF: Stabilization, if necessary and safe storage until geologic disposal is available

Table 1.3: Sites and Offices Surveyed

Complex-wide Review - Sites and Offices Surveyed	LLW	TRU	HLW	HQ
Ames Laboratory	X			
Argonne National Laboratory	X	X		
Brookhaven National Laboratory	X			
Energy Technology Engineering Center	X			
Fermi National Accelerator Laboratory	X			
Fernald Environmental Management Project	X			
Hanford Site	X	X	X	
Idaho National Laboratory Site	X	X	X	
Kansas City Plant	X			
Lawrence Berkeley National Laboratory	X	X		
Lawrence Livermore National Laboratory	X	X		
Los Alamos National Laboratory	X	X		
Mound Site	X			
Nevada Test Site	X	X		
Oak Ridge Reservation	X	X		
Pacific Northwest National Laboratory	X			
Paducah Gaseous Diffusion Plant	X			
Pantex Plant	X			
Portsmouth Gaseous Diffusion Plant	X			
PPPO (Depleted Uranium Hexafluoride Conversion Facilities)	X			
Princeton Plasma Physics Laboratory	X			
Rocky Flats Environmental Technology Site	X			
Sandia National Laboratories	X	X		
Savannah River Site	X	X	X	
Separations Process Research Unit	X			
Stanford Linear Accelerator Center	X			
Thomas Jefferson National Accelerator Facility	X			
Waste Isolation Pilot Plant	X	X		
West Valley Site	X	X	X	
Environmental Management (EM) Program Office				X
Health, Safety & Security (HSS) Support Office				X
Legacy Management (LM) Program Office				X
National Nuclear Security Administration (NNSA)				X
Nuclear Energy (NE) Program Office				X
Science (SC) Program Office				X
Totals	**29**	**12**	**4**	**6**

1.5 CWR Team Organization

The CWR was organized and managed as a project using DOE O 413.3A, "Program and Project Management for the Acquisition of Capital Assets," as guidance. The CWR effort was not a "capital project," however, DOE decided to use the guiding principles of DOE O 413.3A to plan, budget, and manage the CWR. The Deputy Assistant Secretary for Technical and Regulatory Support provided overall direction to the CWR team. Each core team was led by a DOE Federal employee and consisted of individuals (Federal and contractor) from across DOE with experience in radioactive waste management. This expertise included regulatory compliance; generation, treatment, storage and disposal operations; performance assessment (PA); and program implementation. The core teams were responsible for: developing LOIs; interfacing with Points of Contact (POC) at the various Program Offices and sites; evaluating the input received and identifying site and complex-wide successes, best practices, lessons learned and areas of improvement; and writing summary reports. The responses were later consolidated into either best practices or areas of improvement. The Corporate Boards and Energy Facility Contractors Group (EFCOG) Waste Management Working Group identified Federal and contractor site and Program Office POC to assist the core teams in developing the LOIs inputs. A group of Senior Technical Advisors provided independent reviews and recommendations to the team at key points in the process. The CWR organization and process are described in more detail in Appendix A.

Corporate Boards are waste-type (LLW, TRU, HLW) primarily Federal staff groups which meet regularly. These Boards were established to provide a venue to discuss policy, resolve issues, and provide a consistent approach in the management of radioactive waste.

Senior Technical Advisors are highly skilled and experienced individuals with commercial and Federal radioactive waste management experience that provided recommendations to the team at key points in the process.

1.6 Content and Structure of this Report

This report summarizes the CWR results for the LOIs by HQ, HLW, TRU and LLW waste types. The chapters provide a description of the progress for radioactive waste management activities associated with the HQ, HLW, TRU, and LLW surveys. Also, brief compilations of the more notable responses from the LOIs are listed in Chapters 2-5 as either a best practice or an area for improvement.

1.7 Results of the Complex-Wide Review

The CWR database collected over 14,000 responses from the 29 sites and 6 Program Offices surveyed. The compilation of responses showed there has been broad implementation of DOE O 435.1 across the DOE complex with many successes in the handling and disposition of radioactive waste.

A total of 68 best practices (BP) and 139 areas of improvement (AI) have been identified by the waste type core teams through the CWR process. Table 1.4 provides the distribution of the data by waste types and category.

Table 1.4: Distribution of the Most Notable CWR Responses

	High Level Waste		TRU Waste		Low Level Waste		Totals	
Category	**BP**	**AI**	**BP**	**AI**	**BP**	**AI**	**BP**	**AI**
General		1	3	5	2	11	5	17
Generation	5	5	1	4	21	17	26	26
Treatment		2	1	3	4	2	5	7
Storage	2		1		4	3	7	3
WIR	1	9					1	9
Closure	2	1					2	1
Disposal			5	2	7	22	12	24
Crosscutting		7	1	6	2	16	3	29
FEM						2		2
Total	10	25	12	20	40	73	62	118

The HQ review assessed the vulnerabilities identified during the 1996 LLW CWR and concluded that they have been adequately addressed in DOE O 435.1. In addition, the results from the waste type LOIs indicate that the sites have made considerable progress in addressing the 1996 vulnerabilities.

As specified earlier, the goal of this CWR was to obtain feedback from DOE site and HQ Program Offices on the effectiveness and workability of DOE O 435.1. In the three supporting objectives, the review assessed progress in radioactive waste management in 2010 against the vulnerabilities identified in the 1996 CWR, improvements to existing programs and processes, and identification of best practices.

Objective 1 Results – Progress in radioactive waste management compared to the 1999 CWR

DOE has made significant progress in its radioactive waste management activities since the issuance of DOE O 435.1. The Order identified clear lines of responsibility between HQ and FEM and provided requirements for the treatment, storage and disposal of HLW, TRU and LLW. Implementation requirements and guidance were provided to the sites through DOE M 435.1 and DOE Guide 435.1, respectively.

DOE is closing waste tanks at Hanford, Idaho and Savannah River Site and making progress in treating the tank waste stored in underground tanks. Legacy TRU is being reduced through proper characterization and transportation to the Waste Isolation Pilot Plant (WIPP) for disposal, and legacy LLW and MLLW has been greatly reduced throughout the complex. Through the implementation of DOE O 435.1, DOE continues to reduce risk to the workers, the environment and to the public by reducing the amount of waste in storage, treating waste to meet disposal requirements and disposing of waste in a timely manner. Site-specific progress in the management of radioactive waste is included in the *Report to Congress, Status of Environmental Management Initiatives to Accelerate the Reduction of Environmental Risks and Challenges Posed by the Legacy of the Cold War, January 2009.*

While the 1996 CWR was focused on LLW management issues, DOE has made significant progress in its management of all waste types by applying these lessons learned from the 1996 CWR to all radioactive waste management activities. Below is a summary of the LLW vulnerabilities identified in the 1996 CWR along with the current status of efforts to address those vulnerabilities, as identified in the 2010 CWR results.

1996 Vulnerability #1

LLW forecasting and capacity planning is inadequate. Current DOE forecasting and capacity planning efforts do not provide adequate information to support effective and integrated planning.

2010 CWR Results

DOE O 435.1 established site-wide radioactive waste management programs which required sites to forecast generation and disposal for all radioactive wastes. In response, DOE has implemented a number of plans, strategies, data collection systems and management structures to improve forecasting and capacity planning. This information has been used to guide the planning and development of treatment, storage, and disposal capacities and capabilities which has allowed the DOE to successfully dispose of nearly all legacy LLW in storage facilities across the complex. Additionally, similar systems and approaches have been applied to forecasting and capacity planning for the other waste types.

1996 Vulnerability #2

Characterization of LLW is ineffective. Inadequacies and inaccuracies in characterization efforts complicate effective waste management activities and planning.

2010 CWR Results

DOE O 435.1 established minimum waste characterization data requirements to ensure safe management and compliance with a receiving facilities waste acceptance criteria (WAC). WACs include radionuclide concentration limits or action levels (from approved PAs), waste form restrictions, acceptable packaging, and auditable documentation requirements.

The Order also requires that a waste certification program be developed, documented and implemented to ensure facilities' WACs are met. Sites sending LLW to either onsite Comprehensive Environmental Response Compensation and Liability Act (CERCLA) cells or to the Nevada Test Site (NTS) for disposal undergo a review and certification process. NTS periodically conducts surveillances and audits to ensure compliance with its WAC. Sites sending LLW to commercial facilities must meet the Nuclear Regulatory Commission (NRC) or State license requirements prior to sending their waste to these facilities.

Sites have developed best practices such as the "one touch" philosophy where waste is packaged, classified, and characterized in full compliance with its disposition pathway at generation. Others have implemented 'Waste Generator Services Programs' which provide technical expertise to generators on the characterization, treatment, storage and disposition of their waste streams. Application of the same minimum characterization requirements has also proved effective for other waste types.

1996 Vulnerability #3

LLW that has an identified path forward for disposal remains in storage. A lack of specific requirements to dispose of LLW, absence of time limits on the storage of LLW, and competing management priorities, result in indefinite storage of LLW even if there is an identified path forward for disposal.

2010 CWR Results

Strict storage requirements and limits in DOE O 435.1 have reduced stored legacy waste throughout the complex by more than 75%. In addition, DOE O 435.1 allows sites to request an exemption from DOE-only disposal thereby enabling legacy waste disposal at commercial facilities. This exemption process provided an increased disposal capacity for DOE low activity wastes (LAW). The DOE complex has disposed approximately one million cubic meters of legacy waste.[1]

1996 Vulnerability #4

Storage conditions for LLW are inadequate. The potential for releases is primarily from deteriorating packages and storage of waste in a manner that is not appropriately protected from natural events and phenomena based on the inherent risk of the waste stored.

2010 CWR Results

Generating sites store LLW onsite in storage facilities which require adherence to WAC. Sites have established programs that control container integrity, prohibited items, periodic inspection, and time-limits. Application of storage requirements has also proved effective for other waste types. For example, onsite storage facilities at the Idaho Advanced Mixed Waste Treatment Project were improved by complying with DOE O 435.1 which required specific waste forms, container type restrictions, and waste segregation. These improvements also impacted TRU storage at Idaho.

1996 Vulnerability #5

Some LLW has no technical path forward for disposition. The lack of a technically feasible or identified path forward for managing some wastes results in indefinite storage and increased risk for releases to the environment and exposures to workers.

2010 CWR Results

In accordance with DOE O 435.1 requirements, sites have instituted a process to prevent generation of waste with no path to disposal. This process requires the approval of the Site Manager and the identification of conditions that must be met prior to generating waste with no identified path to disposal. This process has prompted sites to reach out to industry and other DOE sites to identify treatment and disposal options which have reduced the quantity of waste with no path for disposal. Bi-weekly conference calls between HQ and the sites and the LLW Corporate Board (LLWCB) meetings have helped sites discuss potential disposition options for more difficult waste streams.

[1] Report to Congress; Status of Environmental Management Initiatives to Accelerate the Reduction of Environmental Risks and Challenges Posed by the Legacy of the Cold War, January 2009

The mixed waste disposal unit at NTS currently allows disposal of higher activity mixed waste that previously had no disposal path. However, this facility will close in 2011 resulting in new waste streams without a disposal path until a new DOE/commercial facility opens. A new mixed waste cell is scheduled to open at the NTS in early 2012. Application of these restrictions on generating waste with no path to disposal has also proved effective for other waste types.

1996 Vulnerability #6

Performance assessments are unapproved and lack adequate requirements. Performance assessments for DOE LLW disposal facilities do not consistently address all considerations important to demonstrating compliance with performance objectives. The approval process for PAs is cumbersome, and results in a lack of confidence regarding long-term protectiveness.

2010 CWR Results

DOE O 435.1 established specific requirements for developing PAs and composite analyses (CAs). All of the LLW disposal facilities have DOE-approved PAs and CAs. Also, DOE O 435.1 requires PAs and CAs to be periodically revised to incorporate the most current data and modeling techniques, which is an ongoing active process.

DOE also established the Low Level Waste Disposal Facility Federal Review Group (LFRG) to ensure these requirements are adequately implemented throughout the complex. The LFRG developed a number of guidance documents that promote the consistent development and review standards for PAs and CAs. The LFRG also establishes teams of technical experts to review new and revised PAs and CAs, provide comments, and recommend management approval of those PAs and CAs. The LFRG documents include a Manual, Program Implementation Plan, Format and Content Guide for LLW Disposal Facility PAs and CAs, Maintenance Guide for LLW Disposal Facility PAs and CAs, and LLW Management Program Research and Development Implementation Plan. In addition, sites are required to prepare annual PA and CA summary reports that review the performance of the disposal facility against the PA and CA performance objectives. The LFRG reviews these reports against the DOE O 435.1 requirements and makes recommendations to management regarding the continued adequacy of the disposal facilities.

Objective 2 Results – Self-assessment tool

As mentioned previously, the CWR established LOIs for assessing site progress in radioactive waste management, both from the HQ and site perspective. Over 14,000 responses were collected in the CWR database. These responses were consolidated and categorized into improvements to and best practices of existing radioactive waste programs and processes. Categorization was based on the following factors: 1) would the complex benefit from adoption, 2) was implementation complex-wide feasible, 3) was adoption across waste types feasible, and 4) was it identified by more than one site.

Objective 3 Results – Compilation of best practices and areas of improvement for improving the DOE O 435.1

The CWR provided the sites with the opportunity to submit comments, ideas, suggestions, examples, and challenges that could be used to improve existing radioactive waste programs and processes. Every site that generates, treats, stores, or disposes of HLW, TRU and/or LLW responded to the LOIs. In some instances, sites with multiple contractors (such as Idaho and Oak Ridge) provided separate responses to the LOIs. A total of 53 LOIs sets of responses were received from 29 sites across the complex.

Most of the ideas and suggestions collected by the core teams would best be categorized as refinements, adjustments, or enhancements to the existing processes. As a result of this analysis, the CWR team recommends that DOE O 435.1 be revised to incorporate these best practices and areas for improvement.

The next section provides more notable examples of the core teams' results.

HQ Core Team

Key Best Practices

- Success in TRU waste management is due to its effective management, planning and integration through the National TRU Program.
- The LFRG is successful in developing and implementing a review process for LLW and TRU disposal and HLW Tank closure PAs across the complex.
- NNSA HQ Conducts biennial reviews of nuclear safety performance (including waste management) at all applicable NNSA Sites.
- Implementation of the Waste Management Information System (WMIS) data base to centralize all waste type forecasting enables real-time information availability for site staff and improves responses to Stakeholder and Congressional questions.

Key Areas of Improvement

- Roles and responsibilities for implementing the oversight function by Program Offices and/or FEM need additional clarification.
- Implementation differences due to funding priorities can lead to inconsistent compliance with DOE O 435.1 requirements. Waste management may compete with other site mission areas for funding or Federal staff may interpret requirements differently leading to these inconsistencies.
- Interaction and integration of DOE O 435.1 with other DOE requirements and DOE O 435.1 with other external regulations, such and CERCLA, the Resource Conservation and Recovery Act (RCRA), and TSCA, should be further clarified. For example, PA assumptions may not be appropriately incorporated into CERCLA documents or long-term stewardship document.
- The process for applying, reviewing, and approving exemptions for the use of commercial disposal facilities needs to be clarified.

- The current definition of "classified waste" in DOE O 435.1 is inconsistent with Information Security Order 470.4-4A.

HLW Core Team

Key Best Practices

- Development of revisions to the waste incidental to reprocessing (WIR) citation procedures to enable sites to safely disposition equipment that had previously come in contact with HLW.

Key Areas of Improvement

- Incorporation of the process for tank closure under the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 Section 3116 (NDAA 3116). Also, clarifying the WIR evaluation criteria for consistent implementation across the complex.
- Recognizing the success of early interaction with regulators and other stakeholders as seen in the scoping meetings conducted as part of NDAA 3116 implementation at Savannah River and Hanford.
- Improvements are needed in the definition of LLW, HLW, and TRU so that they are not based on pedigree.
- Clarifying the requirements for alternative HLW final waste forms (other than glass).

TRU Core Team

Key Best Practices

- Deployment of the central characterization project has increased the efficiency and accuracy of TRU characterization.
- Establishment and implementation of the TRU Corporate Board was used as the standard for establishing the LLW and Tank Waste Corporate Boards.
- Coordination of resources such as transportation packages resulted in reductions in legacy TRU footprint.

Key Areas of Improvement

- Developing a TRU incidental to reprocessing evaluation process with respect to tank waste.
- More efficient/consistent use of the “once through” concept, particularly with respect to the characterization line is needed.
- Improvements in integration in waste handling could be experienced if there were a single contractor for TRU management at each site.
- Identification of annual disposal goals should be included in site waste management planning documents in order to improve consistency and reduce rework.
- Improvements in the disposal process for classified TRU need to be made.

- There is a need to standardize the Authorization Bases to ensure compliance and maximize efficiency.
- Finalization of documentation for and approval of TRUPACT III in order to use large containers in combination with non-destructive assay (NDA) non-destructive examination (NDE) to increase TRU shipments.

LLW Core Team

Key Best Practices

- Establishment of the LFRG and its manual and guidance has improved consistency with requirements of DOE O 435.1.
- Adoption of a "one touch" philosophy which stipulates that at the point of generation, waste will be packaged, classified, and characterized in full compliance with its disposition pathway to minimize overall worker risk and to promote consistency.
- Implementation of the Unreviewed Disposal Question Evaluation (UDQE) procedure at Savannah River Site is the standard for determining the impact to the PA and CA when proposed actions or new information is discovered.
- Developing a LLW Corporate Board has been useful and effective in providing a forum for sharing information across DOE sites.

Key Areas of Improvement

- Establishing DOE's authority to take ownership of radioactive material that is in the national interest.
- There is a need for consistent implementation of radioactive waste management requirements for those sites that have multiple contractors, Field Offices and Program Offices responsibilities.
- Clarification in the appropriate use of concentration averaging.
- Integrating requirements from DOE O 435.1 and those of other regulations such as RCRA, CERCLA, 40 CFR 191, 10 CFR 61 and, NDAA 3116.

1.8 Demonstrated Progress in Radioactive Waste Management

DOE and NNSA have made significant progress in nearly every aspect of radioactive waste management. Much work remains but demonstrable progress has been made, specifically:

- Continued stabilization of radioactive wastes stored in large, aging underground tanks. This is accomplished by transferring the radioactive liquid tank waste from single-shell tanks to more durable double-shelled tanks at Hanford and pursuing tank cleanout and closures at Hanford, Savannah River Site, and Idaho;
- Large volumes of remote-handled (RH) and contact-handled (CH) TRU, LLW and MLLW were disposed successfully;
- Continued remediation of soil and groundwater contamination, thereby mitigating the further spread of these contaminants;

- Decontamination and Decommissioning (D&D) of radioactively contaminated facilities at sites such as Rocky Flats, and replicating the skills learned there to D&D of facilities at other EM sites.

1.9 Path Forward

The results of the CWR are a compilation of data received from various organizations and sites that manage radioactive waste. The data is intended to be utilized to improve existing requirements and practices. These comments, ideas, suggestions, and proposals will be used by the DOE O 435.1 update project teams to define the scope of work. These teams will further refine this information into tasks and revision proposals. The final compilation of proposed changes to the Order, Manuals and Guides will then be tracked and statused through the final approval of the document revisions.

2.0 HQ Core Team Results Summary

DOE Program Office and NNSA Radioactive Waste Management Overview:

The HQ Core Team of the CWR identified four Program Offices and NNSA that had DOE O 435.1 implementation responsibilities within their respective programs for managing radioactive waste. The Program Offices were EM; Legacy Management (LM); Nuclear Energy (NE); Science (SC); and the National Nuclear Security Administration (NNSA). Health, Safety, and Security (HSS) is a HQ Support Office. Personnel from those offices were asked to provide written responses to the LOIs developed for HQ. Follow-up interviews were conducted, as needed, to clarify or amplify the responses.

The Offices of NE and SC manage sites and programs that generate small quantities of radioactive waste. The NE and SC Program Offices were impacted by the 1998-1999 EM re-engineering of waste management to return financial responsibility for newly generated waste to the generating organization. Their combined sites and programs likely generate less than one percent of the total radioactive waste generated by DOE.

The Office of LM receives closed sites from other Program Offices. A long-term surveillance and maintenance (LTS&M) plan is produced prior to the transfer of sites to LM. PA assumptions are expected to be incorporated into the CERCLA Record of Decision (ROD) or the NRC license. For sites cleaned up under the Uranium Mill Tailings Radiation Control Act or Formerly Utilized Site Remedial Action Program, the requirements are placed in the LTS&M plan. LM may encounter radioactive waste and contamination during the management of its sites.

The Office of HSS formulates and implements health, safety and security policy for the Department, providing assistance to DOE and NNSA sites, conducting oversight through rigorous field inspections, and carrying out enforcement activities previously carried out by the Offices of Environment, Safety and Health (EH) and Security and Safety Performance Assurance (SSA). HSS consultation is required during the exemption process for disposing of LLW in non-DOE disposal facilities. HSS also participates in the review of PAs and CAs for TRU and LLW disposal facilities.

The NNSA was established by Congress by Title XXXII of the National Defense Authorization Act for Fiscal Year 2000 Public Law 106-65, as a separately organized agency within DOE to support the mission of deterrence, stockpile stewardship and advocacy for the mission and labs. NNSA is responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation and naval reactor programs. It also responds to nuclear and radiological emergencies in the United States and abroad. Additionally, NNSA provides safe and secure transportation of nuclear weapons and components and special nuclear materials along with other missions supporting the national security. NNSA has DOE O 435.1 management responsibilities at its sites that generate or manage radioactive waste.

The Office of EM manages the largest volumes of radioactive waste in DOE. Over the twenty year history of this office, EM has shifted from studying the management of radioactive waste to dispositioning legacy and stored waste. Currently, EM focuses on radioactive waste cleanup of its sites. If the site has a continuing mission, LTS&M activities upon cleanup completion are transferred to the landlord Program Office. However, if no further mission exists, the site is

transferred to LM. In addition, EM has the responsibility in DOE for developing and implementing radioactive waste management policies and practices.

DOE HQ has had several major achievements which assisted in the progress of radioactive waste management at the sites. While many of these achievements were linked to the response to the DNFSB Recommendation 94-2 or the publication of DOE O 435.1, others were related to other projects such as the DOE response to the Federal Facility Compliance Act of 1992. This progress is outlined below:

- Publication of the National Environmental Policy Act of 1969 (NEPA) documentation supporting DOE's radioactive waste disposition decisions, such as the Final Waste Management Programmatic Environmental Impact Statement (WM PEIS) in 1997. The development of the WM PEIS and the selection of disposal sites were supported by complex-wide analysis of legacy waste volumes and future waste generation estimates.
- Release of the Central Internet Database (CID) to the public in 2000. The CID contained information on contaminated media, facilities, and wastes managed by the EM program and provided a snapshot of EM's waste management scope as of the late 1990s. A formal annual data call to DOE and NNSA sites keeps the data aligned with current planning.
- The National LLW/MLLW Disposition Strategy documents and integrates site waste disposition plans, revises corporate waste data systems, provides for conducting complex-wide analyses, and incorporates programmatic changes/recommendations. Since DOE O 435.1 was issued, much of EM's legacy waste that was in storage at the time of the 1996 CWR has been disposed.
- The National Transuranic Waste Management Plan was issued by the Carlsbad Field Office (CBFO), which has been the lead DOE Field Office for the management, planning and integration of TRU program efforts across the DOE complex. As such, CBFO developed the vision, priorities, and program policies to fulfill the TRU management program missions for EM consistent with the National Transuranic Program Charter. In 1999, DOE's WIPP began receiving TRU and has streamlined the regulatory process and increased volumes of waste received, annually.
- EM established the LFRG in 1997 to develop and implement a review process for LLW disposal facility PAs and CAs or appropriate CERCLA documentation and recommend authorization to operate them to HQ Program Office management. The LFRG establishes technical expert teams to review these disposal facility documents and provide comments. The LFRG is in the process of expanding its scope to include TRU and HLW facilities.
- EM developed an engineering and technology roadmap that describes the current EM engineering and technology risks and divided these risks into five program areas: 1) Waste Processing, 2) D&D and Facility Engineering, 3) Groundwater and Soil Remediation, 4) DOE Spent Nuclear Fuel (SNF), and 5) Integration and Crosscutting Initiatives. The initiatives described in this roadmap are expected to ensure EM's success in achieving the safe and compliant disposition of the radioactive waste covered by DOE O 435.1.
- Established lessons learned tracking for identifying successful programmatic and technological achievements experienced by EM in its accelerated site closures at Rocky Flats, Fernald, and Mound sites.

2.1 HQ CWR Results

Best Practices

- Development of Corporate boards for waste types have helped improve complex-wide communication in implementing requirements and resolving issues.
- The Waste Information Management System (WIMS) provides radioactive waste disposition reports and disposition maps for DOE, NNSA and the public. For DOE and NNSA waste and material stream data: WIMS is maintained by Florida International University, and can be accessed at: http://wims.arc.fiu.edu/wims/. The input to WIMS comes annually from a formal data call to all DOE sites with radioactive waste management known as the Baseline Low Level Waste and Materials Disposition Data.
- EM established the LFRG to develop and implement a review process for LLW and TRU disposal facilities and tank closure PAs and CAs or appropriate CERCLA documentation as described in the LRFG Charter. The LFRG provides a critical independent technical review of PAs and CAs and has enhanced the consistency and accuracy of PAs and CAs across the complex through the review process.
- NNSA HQ conducts biennial reviews of nuclear safety performance at all applicable NNSA Sites, which includes an assessment of compliance to DOE O 435.1 requirements. Radioactive waste management objectives and criteria were developed incorporating the applicable requirements of DOE O 435.1.
- EM worked with LM early in the site closure process. Examples of efficient closure practices at Fernald include achieving agreement with all interested parties to asphalt over a building foundation and use it for a parking lot instead of removing the foundation. In addition, instead of filling in a low area in the terrain, the low area was turned into a marsh for wildlife habitat.

Areas of Improvement

- DOE O 435.1 should clarify the integration of CERCLA with DOE closure requirements as it relates to in-situ closure of large nuclear facilities. Large nuclear facilities are beginning to undergo D&D throughout the complex. Some of these facilities are required to be close under CERCLA and DOE O 435.1 requirements. Closure of facilities under two regulatory authorities is not efficient or cost effective.
- DOE HQ does not have an integrated Complex-Wide Management Plan for HLW or LLW/MLLW. Many of the functions intended by the Order are being performed, but there is not a documented plan that drives these functions in EM at the HQ level.
- DOE O 435.1 should clarify who has the authority to issue Disposal Authorization Statements (DASs) for non-EM Program Offices or NNSA. DOE may need to evaluate unresolved issues with respect to overall implementation of the cross-program authorities, as DOE O 435.1 is updated.
- In general, HQ independent oversight functions of DOE O 435.1 and the roles and responsibilities of Program Offices and FEM need clarification. DOE O 435.1 also needs to clarify that annual reviews can be conducted by the DOE Consolidated Audit Program which conducts these for the complex, eliminating duplication in auditing.

- DOE's responsibilities in implementing the Atomic Energy Act (AEA) authorities should be specifically defined in DOE O 435.1.
- Commercial exemptions need to be clarified in the revised DOE O 435.1. The current requirements were written presuming exemptions would be for an existing, characterized quantity of waste. In practice, some exemptions have been approved for ongoing streams for which the characteristics could be estimated. The degree of certainty in the definition of future waste streams required to obtain an exemption should be further clarified. There has been a difference in the interpretation of exemption requirements for disposal of DOE MLLW at non-DOE disposal facilities. Some SC sites are sending MLLW offsite for disposal without following DOE O 435.1 exemption process.
- The current definition of "classified waste" in DOE O 435.1 does not align with Information Security Order 470.4-4A. The information security order does not recognize "classified waste." Rather, the term "nonconforming storage and permanent burial of classified matter" is used.
- The DOE O 435.1 should evaluate changing human intrusion to a performance objective versus a performance measure. Performance objectives appear to have a higher value than performance measures in DOE O 435.1. DOE should clearly establish its authority to take ownership of any nuclear material, including sealed sources, in the national interest and disposition the material as they see fit, including reuse or disposal.
- DOE should clarify that States have no jurisdiction over the radiological content of DOE LLW.
- DOE O 435.1 should require organizations closing and transferring property to LM to interface with LM early in the process. Analysis of life cycle costs should be required to include the LTS&M costs of managing wastes. The basis for decisions made in designing, operating, and closing a facility, and the expected ramifications of those decisions should be documented and passed on to the organization providing long-term management after closure. For example, a result of the decision to grow prairie grass on top of the disposal site is that it will have to be periodically burned which could result in a release of radioactivity to the environment.
- Issues associated with the linkage between a Monitoring Plan developed for an operating disposal facility and the draft of the LTS&M plan should be addressed during the DOE O 435.1 update.
- The process of incorporating PAs requirements into CERCLA applicable or relevant and appropriate requirements (ARARs) should be clarified in DOE O 435.1.
- The requirements and format of DOE O 435.1 should clarify that waste management programs be developed and maintained within the ISMS framework.
- The FEM requirement to consult with host States or State compacts where non-DOE Treatment, Storage, and Disposal Facilities (TSDFs) are located needs to be clarified. DOE O 435.1 requires this contact be made prior to approval of an exemption and to notify them prior to shipments being made.

- DOE O 435.1 should be revised to provide clarification to sites with multiple Program Offices on complying with the Order. Funding must be provided by the Program Offices, whether a single or multiple contractors and Program Offices are at that site, to prevent different levels of compliance.
- DOE O 435.1 needs to impose limits on the ability to claim future reuse of material, particularly if there is no clear future reuse. Labeling as future reuse should not be used as a method of circumventing storage limits in DOE O 435.1. There should be more opportunities to allow the transfer of responsibility of certain newly identified legacy radioactive wastes from other Program Offices to EM.

3.0 HLW Core Team Results Summary

HLW Management Overview

DOE and its predecessor agencies generated liquid radioactive waste as a byproduct of reprocessing SNF for the production of nuclear weapons. EM is currently storing 88 million gallons of liquid "tank waste" in 230 underground tanks at three sites:

- Hanford Site (Hanford) in Washington State – 54 million gallons in 177 tanks
- Savannah River Site (SRS) in South Carolina – 33.1 million gallons in 49 tanks
- Idaho National Laboratory (INL) in Idaho – 0.9 million gallons in 4 tank
- Formerly, HLW was also stored at the West Valley Demonstration Project (WVDP) in New York.

In addition to the stored liquid waste, DOE has treated tank waste at SRS, WVDP and INL using vitrification (SRS, WVDP) and calcination (INL). These treatments provide for the liquid wastes being converted into a solid waste form and allow for safe storage pending final disposition. EM is currently storing treated HLW as follows:

- SRS -2,859 canisters of glass stored onsite
- INL- 4,386 cubic meters of calcine stored onsite
- WVDP - 275 canisters of glass stored onsite

Liquid highly radioactive waste stored in underground tanks is by far DOE's most significant environmental threat. Many of these underground tanks have exceeded their design lives. EM expends considerable resources and attention in monitoring and maintaining the tanks to ensure their integrity is sound and that workers can safely perform the necessary tank maintenance and ongoing remediation activities. Because of the unique and hazardous nature of this radioactive waste, innovative technologies for waste retrieval and disposition are under development. This includes constructing treatment plants to convert liquid waste into a stable, long-lasting waste forms, such as glass, until it may be safely disposed in a geologic repository.

DOE has made noteworthy progress in the management of HLW. Implementation of stricter liquid HLW storage requirements has reduced the risk to the worker, the public and the environment. Treatment facilities are either operational or under construction that will convert liquid HLW into a stable solid waste form. Overall, the sites have implemented the HLW requirements for generation, storage and treatment established in DOE O 435.1.

Management of tank waste residuals, once a tank has been emptied and is ready for closure, raises issues regarding closure requirements. Congress addressed these issues with passage of the NDAA 3116. NDAA 3116 provides for a process and performance standards for closure of tanks that contain HLW residuals. NDAA 3116 only applies to tank waste located at INL and SRS. NDAA 3116 establishes requirements for the Secretary of Energy, in consultation with the NRC, to determine that the provisions of NDAA 3116 are met and the waste is not HLW, so that such waste may be disposed of as LLW. EM is actively working with the NRC to disposition residual

waste that cannot be practicably retrieved (e.g., internal equipment and the tank shells) in accordance with the requirements of NDAA 3116. For tank closure at Hanford and WVDP, the DOE O 435.1 WIR process will be utilized. Both NDAA 3116 and DOE O 435.1 allow EM to close tanks, after removing highly radioactive radionuclides to the maximum extent practical, meeting performance objectives and other requirements, and then filling the entire tank volume with grout. These efforts will allow EM to meet the tank closure requirements and schedules of its compliance agreements at SRS and INL.

3.1 Results of the CWR

HLW management activities were reviewed by the Core Team and responses were categorized as General HLW Issues, Generation, Treatment, Storage, WIR, Closure, Disposal, and Crosscutting.

3.1.1 General

Area of Improvement

- The revision to DOE O 435.1 should include guidance on improving the contracting process for work scopes, to include adequate reviews early in the contracting process which will ensure issues such as waste management responsibilities and the waste disposition path be specifically identified in contract language. For wastes that may be difficult to manage, this information must be addressed as early as possible in the process.

3.1.2 Generation

Best Practices

- Implementation of electronic databases provides a continuously updated source of tank waste inventory information that is used to determine real time treatment strategies and requirements; allows the operator to stage wastes for treatment; and enables the operator to plan retrievals, waste transfers, and evaporator campaigns.

- The HLW System Plan is updated on an annual basis and is a highly effective tool for determining the time and treatment capacities required to treat tank waste; the sequence of retrievals and waste blending required to optimize treatment operations; the quantities of HLW canisters, LAW containers, and secondary liquid and solid wastes (and their inventories) requiring disposal.

- A Citation Process waste determination for Secondary Tank Farm waste has been developed at Hanford that greatly simplifies resolution of issues typically associated with the disposition of tank farm secondary wastes and contaminated media. The revision to DOE O 435.1 should include this process.

- While DOE O 435.1 does not require Field Managers to provide an annual update letter to DOE documenting any known or potential wastes with no identified path for disposal, several site contractors provide these annual update letters to the Field Manager and it is found useful in forecasting needs for future TSD. This should be included in the revision.

Areas of Improvement

- DOE O 435.1 should address a process for waste with no path for disposal of HLW resulting from research and development (R&D) projects, including "sample exclusion." Other regulatory agencies have an exemption excluding samples from the full requirements of the regulation.

- The NDAA 3116 criteria and language should be incorporated into DOE O 435.1, since the NDAA process has been tested. In addition, the WIR evaluation process criteria provide a basis for exempting certain reprocessing wastes from being classified as HLW. While those criteria were developed by the NRC and DOE jointly, DOE M 435.1 does not explain how the WIR criteria implement the Nuclear Waste Policy Act (NWPA) HLW definition. A linkage should be provided between the DOE O 435.1 criteria and the NWPA HLW definition.

- DOE O 435.1 should provide further explanation for required spare capacity (specifically solids) of HLW tanks should be provided. The requirement should only apply to liquid tank waste and not the treated waste that has been converted to a solid.

- Alternative waste form requirements (other than glass) need to be clarified. There is no process to qualify treated waste forms other than glass. This is an issue for treated HLW at INL (calcine waste form).

3.1.3 Treatment

Areas of Improvement

- The DOE O 435.1 revision guidance should specify that sites should ensure the adequacy of information and criteria that will be used to establish design and safety basis requirements relevant to design seismic and other natural events and processes for HLW facilities early in the critical decision, safety analysis, and design processes. Failure to do so has significantly impacted the cost and schedule for tank waste related treatment facilities at Hanford, INL, and SRS.

- Criteria, process, and regulatory path forward for tank wastes that have TRU characteristics, but were not directly produced during SNF reprocessing, should be addressed in DOE O 435.1.

3.1.4 Storage

Areas of Improvement

- DOE O 435.1 revision should provide guidance on tank corrosion technology selection. The INL tank corrosion monitoring program has been recognized by DNFSB as a best practice and this should be provided as an example in the guidance.

- DOE O 435.1 guidance revision should identify example technologies that minimize tank degradation and improve surveillance and maintenance. The WVDP is currently in the preliminary design phase for a waste tank and vault drying system whose purpose is to evaporate residual heel liquids and thus establish and maintain dry storage conditions within the underground tanks and vaults at WVDP. This minimizes degradation mechanisms and the extent of on-going surveillance and maintenance.

3.1.5 WIR

Best Practice

- The WIR Determinations procedure utilized to close INL tanks is recognized as a standard for other sites.

Areas of Improvement

- The WIR process identified in the current DOE O 435.1 and NDAA 3116(a) should be integrated into one process in the revised DOE O 435.1.
- The authority to make WIR determinations by the Evaluation Process needs to be clarified in the DOE O 435.1 revision. HQ policy is not consistent with the Order.
- The DOE O 435.1 revision definition of "fission products in sufficient concentration" should be clear.
- DOE wastes are defined based on which process produced the waste, called the "pedigree." DOE O 435.1 should be revised to define the radioactive waste types but their risk, not origin. This would assist in future disposal decision and such areas as clarifying the definition of SNF reprocessing.
- The revision to DOE O 435.1 should define the basis for determining key radionuclides. Sites are currently developing individual methods for determining key radionuclides and attempts are being made to be consistent but it would improve the regulatory process if guidance were provided.
- DOE O 435.1 should provide better guidelines for removal of key radionuclides to maximum extent practical.
- A TRU Evaluation Process under the WIR needs to be better defined in DOE O 435.1.
- Expanding the list of Citation wastes to match and be consistent with wastes previously cited by the NRC, as well as those already determined within the complex not to be HLW, could serve to simplify the overall WIR process.

3.1.6 Closure

Best Practice

- The guidance to the revised DOE O 435.1 should include a discussion on improving communication among DOE its regulators and other stakeholders. SRS and INL conducted scoping meetings among DOE, State regulators, the Environmental Protection Agency (EPA), and NRC as part of the NDAA 3116 tank closure process. This is also being implemented at Hanford for their C Tank Farm WIR. This consensus building process should result in schedule and cost efficiencies.
- The DOE O 435.1 revised guidance should provide addition information regarding grout technologies for closing underground storage tanks. INL used reducing grout for a bottom layer to stabilize Tc-99 in tank residuals which was well received by stakeholders and regulators.

3.1.7 Crosscutting

Areas of Improvement

- Provide guidance in DOE O 435.1 that clearly explains integration with other regulations (e.g. CERCLA, NDAA 3116, and RCRA).
- Additional improvements could be provided in DOE O 435.1 for management of WIR materials as LLW/MLLW/TRU.
- Guidance on the Tank Waste Corporate Board should be provided in the DOE O 435.1 to recommend improving communicate with waste management professionals at the working level to ensure facility and generator issues can be elevated to the Board as needed.
- DOE O 435.1 should clarify that site Federal Facility Agreements entered into with a State(s) and EPA that includes closure requirements should be considered equivalent to those documentation requirements as CERCLA closures.
- DOE O 435.1 revision should provide additional clarification of expected site reactions for "upsets" occurring in TSDFs.

4.0 TRU Core Team Report Summary

TRU Management Overview

During the nearly 10 years of WIPP operations, experience has been gained and the regulatory framework has been streamlined. The DOE National TRU Program (NTP), operated out of the CBFO, has led the program complex-wide in characterizing and shipping TRU to WIPP. NTP oversees the Central Characterization Project (CCP), representatives of which can be found across the complex as an integrated team of contractors providing characterization and shipping services from their sites. CCP is deployed to sites needing additional TRU processing or where DOE realizes savings by avoiding the costs of capital expenditures and the start-up of new operations. Integrated planning between the CBFO, CCP, and all TRU sites for waste retrieval, waste packaging, waste characterization, and waste shipping has been the key to sustained throughput of TRU shipments to WIPP. As a result, with each passing year, operations have become more efficient and routine.

The waste generator is responsible for ensuring that waste generated under a classified program is declassified or rendered suitable for unclassified radioactive waste management. In some cases, waste is visually inspected under the CCP Visual Examination Program at the time of packaging to ensure there is no classified matter in the waste. The CCP uses a modular waste characterization system consisting of full disposal characterization equipment for TRU and a mobile loading system used to place drums of TRU into shipping containers for transport to WIPP. The CCP has proven successful in characterizing waste more cost effectively through the use of a standard suite of procedures, quality assurance documents, and equipment. DOE is also expanding the use of the CCP at large sites.

DOE HQ instituted a change control process for TRU shipments to WIPP. This process has improved coordination between the CBFO and TRU sites to balance field site priorities and needs against transportation resources and WIPP operational constraints. The National TRU Waste Complex Corporate Board was established to implement the business strategy for the NTP managed by the CBFO. Through the Corporate Board, which includes senior DOE and contractor representatives from TRU sites that are actively shipping, integrated prioritization and optimization of corporate initiatives has been realized. Another strategy includes the use of TRU waste expert teams for assisting the generator sites in their certification and characterization planning for more difficult waste streams, such as those requiring additional documentation, treatment, or packaging. These teams help to ensure all TRU is characterized, shipped, and disposed at WIPP.

As of January 2010, nearly 64,600 cubic meters of TRU have been emplaced in WIPP and 14 sites have been de-inventoried. The DOE complex will continue to generate TRU through at `least 2050 from ongoing missions, as well as from D&D of radioactive waste treatment facilities. DOE is evaluating alternative strategies to sustain the most efficient operation of WIPP as TRU legacy waste disposal winds down after 2020.

DOE has invested American Recovery and Reinvestment Act funding in the TRU Waste program that will accelerate the clean-up and nuclear footprint reduction of many legacy TRU waste sites. WIPP is currently the only certified and operational deep geologic repository for radioactive waste disposal.

4.1 Results of the CWR

The CWR included 12 sites that generate, treat, store, and/or dispose of TRU. This included five large quantity sites (SRS, INL, Hanford, Oak Ridge, and Los Alamos National Laboratory) and seven other sites, including WIPP.

TRU management activities were reviewed by the Core Team and responses were categorized as General TRU Issues, Generation, Treatment, Storage, WIR, Closure, Disposal, and Crosscutting.

4.1.1 General

Best Practices

- The CCP has proven successful in characterizing waste more cost effectively through the use of a standard suite of procedures, quality assurance documents, and equipment. The revision to DOE O 435.1 could provide additional guidance on the use of the CCP.

- DOE O 435.1 allows flexibility in identifying methods of complying to meet the WIPP WAC. One improvement in meeting the WAC includes container screening by real time radiography (RTR) using cleared operators to identify any security-related items. Classified items found are managed under a security plan written for TRU Waste Operations. This process avoids the need for a new program in the characterization processes for handling waste streams that may be classified.

- NDA and NDE technologies have been developed and demonstrated to enable shipment of large TRU containers, without repackaging, greatly reducing risks to the workers, saving $600 to $900 million in shipping costs, and shortening their disposal schedule by 8 to 12 years. The revision to DOE O 435.1 could provide additional guidance on the use of NDA/NDE.

Areas of Improvement

- The revision to DOE O 435.1 should encourage DOE sites to manage TRU under one EM program with one primary contractor. This would allow the DOE program and the single contractor to focus all resources on one goal of feeding TRU to the characterization lines and making shipments of TRU to WIPP.

- DOE M 435.1 does not provide sufficient information for the generation and disposal of radioactive classified matter.

- The differences among TRU, HLW, and WIR need to be clearly defined in the revision to DOE O 435.1. Further, the definitions of the requirements for minimum detection limits of assay systems so that the disposition of waste is either TRU or LLW.

- The revision to DOE O 435.1 should consider an exemption for DOE experimentation activities involving used fuel.

- Improvements to the processes for waste shipping should be developed in the revision to DOE O 435.1. Several sites in DOE would benefit by approval of the TRU Package

Transporter (TRUPACT) III and the design of a WIPP-receipt system to transport large boxes of TRU to WIPP.

- The revised DOE O 435.1 should address classified TRU material disposition prior to assignment to a waste management contractor or CCP. All 'Acceptable Knowledge' related documentation should be reviewed for public release prior to assigning the waste to be dispositioned.

- The revised DOE O 435.1 should address requirements for a quality records program for all records detailing the history of a waste stream, the processes used to generate the waste, the facilities in which the waste was generated, the training of the personnel in the processes, and any information that may need to be used in an 'Acceptable Knowledge' program. Also, the records must be readily available and releasable to the public in a timely manner.

4.1.2 Generation

Areas of Improvement

- The revision to DOE O 435.1 should address the impacts of "Work for Others" (WFO) programs when work scope for non-DOE defense-related programs could produce TRU. These programs can generate waste with no disposal path.

- Provide clear guidelines for staging TRU prior to characterization for disposal. Site restrictions for handling TRU waste containers should be minimized so that characterization and shipping rates can be maximized. The Order should address site-specific and even building-specific Authorization Basis (AB) constraints at TRU waste sites

- Define the requirements for minimum detection limits of assay systems so the disposition of waste as either TRU or LLW is clear.

- Packaging instructions for both contact- and RH TRU must be included in the revision of DOE O 435.1 to reduce the need for re-work and remediation. Adding these instructions in the next revision of DOE O 435.1 will provide direction to sites to properly equip their facilities to perform the instructions.

4.1.3 Treatment

Areas of Improvement

- DOE O 435.1 should provide guidance and operating examples on improved technologies for managing TRU. The ORNL TRU Waste Processing Center (TWPC) designed a pintle-based lift fixture for 55-gallon drums, greatly increasing the efficiency of remote drum handling in the hotcell. TWPC also developed an in-drum liner to be used in the hot cell to allow for transfer of waste to CH drum-out ports eliminating the need for re-packaging.

- Revisions to DOE O 435.1 should include requirements that sites segregate drums and boxes of legacy waste that may have contain liquid. If liquids are absorbed or treated during remediation process, the waste stream can be disposed as TRU.

- The revision to DOE O 435.1 should address the need for treatment facilities to be provided for 25 identified problematic waste streams

- The revision of DOE O 435.1 should clarify the definition of treatment to include that which is required to make the waste form or waste package compliant with disposal WAC. Currently, TRU is considered treated if making the waste form or waste package compliant with local DOE waste management requirements such as Documented Safety Analysis (DSA) limitations, As Low As Reasonably Achievable (ALARA) practices, or local hazardous waste treatment standards.

4.1.4 Storage

Area of Improvement

- The DOE O 435.1 revision should provide guidance supporting storing like waste together to build "target-rich waste storage modules." This approach provides better efficiency in gathering containers for outgoing shipments.

4.1.5 Disposal

Best Practice

- DOE O 435.1 has a clear strategy for building on past success to meet its TRU risk reduction goals. This strategy has enabled expanding the number of sites certified for TRU shipping.

- DOE O 435.1 provides the flexibility to allow characterization of small quantity sites' TRU in INL prior to shipment to WIPP avoids the need to construct TRU treatment facilities at sites with small quantities.

- DOE O 435.1 recognizes the need for continuous improvements such as the "Difficult Waste Team" comprised of TRU waste experts who assist generator sites in certification and characterization planning for more difficult waste streams, such as those requiring additional documentation, treatment, or packaging.

- DOE O 435.1 allowed a regulatory permit modification process which DOE used in its submitting a regulatory permit modification request to the New Mexico Environment Department to streamline waste characterization processes. These changes streamlined processes that resulted in the elimination of serious radiation exposure hazard to DOE workers.

Areas of Improvement

- The revised DOE O 435.1 should exempt TRU disposed prior to 1985 in shallow land disposal units from requirements in 40 CFR 191. This would resolve the inconsistencies in application of the TRU definition during the period after the 1970 Atomic Energy Commission directive and before promulgation of 40 CFR 191 in 1985.

- The revised DOE O 435.1 should identify a disposition path for non-defense TRU. In accordance with the legal requirements for WIPP, DOE cannot dispose of non-defense TRU

at WIPP. The DOE estimates up to 2,700 cubic meters of non-defense TRU have no disposition path.

4.1.6 Crosscutting

Best Practices

- DOE O 435.1 recognizes the continuous improvements needed to maintain a highly technical program, such as the TRU program. The TRU waste sites through the TRU Corporate Board and bi-weekly interface calls are effective with timely resolutions of issues and constant promotion of common goals for the TRU program.

- An improvement currently being implemented is a "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 (i.e., treatment or disposal). The revision to DOE O 435.1 should address this “once-through” approach as a requirement.

Areas of Improvement

- The revision to DOE O 435.1 should include further complex-wide discussion regarding crossing waste type/regulatory authorities for "problematic" waste, as there is little to no guidance currently in the Order for CERCLA, RCRA, and Toxics Substances Control Act (TSCA) issues. Guidance should also include a prohibition on the dilution of waste forms in an attempt to make the waste fit a specific final disposition path.

- Some sites have a need for the exemption of onsite shipment of TRU with special conditions. Transfer of special condition waste (liquids, pressurized containers, etc.) is difficult to perform in compliance with DOT regulations. Onsite transfers are required to move waste with known problems from retrieval and storage facilities to repackaging facilities.

- The revised DOE O 435.1 should provide guidance for handling inadvertent disposal situations. TRU waste sites should be provided guidance to prepare them to receive returned shipments in the event of non-compliance.

- DOE should provide significant incentives to contractors for cost effective, timely, and compliant disposition of TRU. DOE should integrate Performance-Based Incentives for all of its contractors teamed together for TRU disposition.

5.0 LLW Core Team Report Summary

LLW Management Overview

DOE has significantly improved the management of its LLW. The sites have implemented the LLW requirements for generation, storage, treatment and disposal established in DOE O 435.1. LLW volume forecasting has improved over the years providing better life-cycle estimates and TSDF capacity impacts. Implementation of stricter LLW storage requirements reduced legacy waste by approximately one million cubic meters, which also reduced the risk to the worker, the public, and the environment. In addition, DOE disposal facilities have approved DASs, which include approved PAs and CAs, maintenance plans, monitoring plans, closure plans and WACs.

In addition to the issuance of DOE O 435.1 in 1999, in 1997 the DOE WM PEIS evaluated the environmental impact of managing LLW (including MLLW) across the complex. The ROD, issued in 2000, detailed the Department's decision to treat and dispose LLW onsite, where practical, and at established regional disposal facilities.

DOE has implemented a number of plans, strategies, data collection systems and management structures to improve forecasting and capacity planning. The National LLW/MLLW Disposition Strategy provides a complex-wide optimization plan. Baseline LLW & Material Disposition Data provides projected life-cycle disposition of LLW and MLLW waste streams. Each LLW generating site has a waste tracking system that can be used to assist in forecasting. An electronic data base, WIMS, was developed to provide HQ and site waste managers with the tools necessary to manage the forecasted waste streams. CWR responses indicate adequate waste capacity within the complex provided the new MLLW cell at the NTS is operational in the next year.

Improvements to the capacity planning include waste characterization requirements, best practices such as the "one touch" philosophy, and waste generator services programs. These improvements have resulted in the development of waste certification programs that ensure receiving facility WACs are met. Sites sending LLW to either onsite CERCLA cells or to the NTS for disposal undergo a review and certification process. NTS periodically conducts surveillances and audits to ensure compliance with the WAC. Sites sending LLW to commercial facilities must meet NRC or State license requirements prior to sending their waste to these facilities. The sites which follow the "one touch" philosophy, package, classify, and characterize their LLW and MLLW in full compliance with its disposition pathway at generation. Some sites have developed Waste Generator Services Programs which provide technical expertise to generators on the characterization, treatment, storage and disposition of their waste streams.

DOE O 435.1 instituted a one year limit on storing LLW and MLLW. Most sites no longer store waste for more than the one year storage limit. While some sites have approval from their DOE site office to store waste for more than a year, it is only for enabling the site to accumulate enough for an economical shipment. While DOE O 435.1 requires disposal onsite or at NTS, an exemption process allows LLW to be disposed in commercial facilities and this opened a new disposal path for LAW. The complex has disposed approximately one million cubic meters, representing 75% of the legacy waste inventory, in facilities in Nevada, Washington, Tennessee, New Mexico, South Carolina, Idaho, and Utah.

Sites have instituted a process to control the generation of waste with no path for disposal. This process requires the approval of the Site Manager and the identification of conditions that must be met prior to generation. This process has prompted sites to reach out to industry and other DOE sites to identify treatment and disposal options which have reduced the quantity of waste with no path for disposal. Bi-weekly conference calls between HQ and the sites and discussions at the LLWCB meetings have helped sites strategize potential disposition options for more difficult waste streams. The sites indicate that working with commercial treatment facilities to develop needed processes has helped disposition "no path" wastes.

DOE O 435.1 established specific requirements for developing PAs and CAs. DOE also established the LFRG to ensure these requirements are adequately implemented throughout the complex. The LFRG developed a number of documents that promote the consistent development and review of PAs and CAs. Those documents include: LFRG Charter, LFRG Manual, LFRG Program Implementation Plan, Format and Content Guide for LLW Disposal Facility PA & CA, Maintenance Guide for LLW Disposal Facility PA & CA and LLW Management Program Research and Development Implementation Plan. All of the LLW disposal facilities have DOE-approved PA and CA. In addition, the sites are required to prepare a PA and CA annual report that reviews the performance of the disposal facility against the PA and CA performance objectives. The LFRG reviews these reports against the DOE O 435.1 requirements. Other improvements include a PA Community of Practice to improve the consistency of implementation of PAs and CAs across the DOE Complex.

LLW management activities were reviewed by the Core Team and responses were categorized as General LLW Issues, Generation, Treatment, Storage, WIR, Closure, Disposal, and Crosscutting.

5.1 Results of the CWR

The CWR included 29 sites that generate, treat, store, and/or dispose of LLW, and MLLW. This included 5 large (INL, SRS, NTS, Hanford, and Oak Ridge) and 24 small sites. The sites completed the appropriate LOIs according to their LLW management responsibilities. Small sites may have only completed the general, generation, storage, and offsite disposal sections. Large sites normally completed all the LOIs.

5.1.1 General

Best Practices

- DOE O 435.1 promotes systematic improvements in approaches taken to comply with the Order. The "one touch" philosophy stipulates that at the point of generation waste will be packaged, classified, and characterized in full compliance with its disposition pathway to minimize overall risk and to promote consistency. This philosophy is a cost effective approach.

- Implementation of a central Waste Generator Services Program provides technical expertise for the generation, treatment, storage and disposition of waste streams generated onsite. This practice ensures there is a consistent and cost effective approach to waste management across a site. This approach is consistent with guidance provided in DOE G 435.1.

Areas of Improvement

- The revision of DOE O 435.1 should recognize that sites have multiple Program Offices and contractors responsible for radioactive waste management. This arrangement has caused concerns in ensuring that DOE O 435.1 requirements are being implemented consistently and oversight is properly performed.

- Subcontractors and WFO complicate the implementation and oversight through incomplete identification of waste management responsibilities in contracts and agreements. Some direction is needed to address these new circumstances.

- DOE should clearly establish its authority to take ownership and manage any nuclear material, including sealed sources, in the national interest and to disposition the material appropriately including reuse or disposal. DOE O 435.1 should develop a formal, consistent process that considers the technical basis, regulatory issues/authority, and approval process for transferring ownership and accepting non-DOE LLW in DOE facilities.

- DOE should make the distinction that separation of irradiated experimental fuels into components for experimentation purposes does not constitute "reprocessing" or an explicit exemption for DOE experimentation activities should be considered in DOE O 435.1. DOE O 435.1 should clarify the term “small quantity” as applied to 11(e) 2 byproduct materials. There has been some confusion in the past on the definition of small quantity.

- Some subcontracts do not provide detailed analytical data requirements for waste. A program should be established to delineate the site characterization analytical data required for subcontractors to characterize the waste adequately.

- When two or more contracts are on different procurement cycles and have overlapping lifetimes, it may result in multiple transition activities during the completion of any specific site cleanup project. Guidance should be provided describing methodologies for use in the transition of projects from one contractor to the next and should contain enough detail to ensure DOE and contractors are cognizant of their responsibilities for project transition.

- DOE O 435.1 should provide flexibility for future disposal operations if NTS were not available. Currently there is no agreement or end state for waste management operations after EM's expected tenure at the NTS, which ends in 2027.

- The NTS Mixed Waste Disposal Unit (Pit 3) will close November 30, 2010, and no equivalent NTS capability is expected online before that date. Unless other potential facilities are opened for disposal of federal mixed waste that exceeds NRC Class A, there will be no path to disposal for these wastes after November 2010.

5.1.2 Generation

Best Practices

- Waste, regardless of final disposition (DOE or commercial disposal) must be managed under a waste certification program in compliance with DOE O 435.1.

- DOE O 435.1 requires that waste disposition paths are evaluated to ensure the most efficient and economic option is selected.

- DOE O 435.1 requires regular auditing of LLW programs, regardless of the disposal facility, which promotes continued compliance.

- Periodic reviews of LLW characterization have been beneficial to ensuring continued compliance with DOE O 435.1.

- DOE O 435.1 guidance encourages generators to maintain communication with TSDF personnel to successfully work to modify existing permits allowing expanded isotopic inventories or obtain new permits for unique waste treatment standards. Generators may also assist offsite TSDF personnel in obtaining permit modifications to receive treatment authorization for difficult-to-treat wastes.

- DOE O 435.1 provides guidance to encourage technology advancements to be achieved. For example, diamond wire cutting, as was used on the large TOKAMAK Fusion Test Reactor vacuum vessel, can be used for cutting of complex metal objects for size reduction increasing disposal options.

- Authorization to use a RCRA "No Longer Contains" ruling greatly reduces disposition costs. DOE O 435.1 provides the flexibility to use alternate regulatory options to improve efficiency.

Areas of Improvement

- The tracking of radiological and nuclear materials on a site will support planning for waste generation, since these materials are the primary source for generated waste. DOE O 435.1 should be revised to include the tracking of materials as well as wastes.

- Establishing a standardized volumetric density per matrix in the guidance to DOE O 435.1 would help to standardize waste forecasting and environmental impacts to the TSD facilities.

- Establishing an Integrated Waste Tracking System would provide for certification of waste streams and centralized information for identifying and tracking disposition paths. DOE should consider development of a centralized waste support services group, similar to site-specific ones, which would be responsible for managing wastes from the point of generation to final disposition to ensure a consistent approach to waste management.

- Regional disposal facilities, such as NTS, can provide assistance to their users to promote effective waste management by addressing classified waste, generator certification, waste acceptance, and lessons learned.

- Site Generator Certification Officials should be continuously trained and updated when issues are identified and resolved.

- DOE O 435.1 should provide improved guidance on uncertainties in the characterization of LLW such as when waste is characterized using indirect means or ‘Acceptable Knowledge’.

- DOE O 435.1 should require that the status of wastes identified as "waste with no path for disposal" be reviewed and updated annually in order to maintain an emphasis on developing a disposition path for this waste. DOE O 435.1 should require each waste stream to be "re-certified" by the generators on a two year basis or when significantly changed. Characterization issues arise when generators do not re-evaluate waste streams periodically or when processes change that generate the waste stream.

- DOE O 435.1 should specify a biannual review of generators' waste management programs in order to ensure proper treatment, storage and disposal of waste.

- DOE O 435.1 should provide additional guidance on void space requirements to ensure waste packaging is conducted in a cost effective manner and assist in preventing subsidence in the disposal facility.

- DOE O 435.1 should be updated to provide an interpretation on the classification of accelerator-produced waste in reference to the byproduct material definition.

- The revision to DOE O 435.1 should include provisions on characterizing waste streams and containers when comingling occurs.

- DOE O 435.1 requirements should distinguish between TSDFs and waste generators.

- DOE O 435.1 should be revised to include language on the appropriate use of concentration averaging.

- Since depleted uranium does not contribute to fission risks in PAs, DOE O 435.1 guidance should allow sites to list depleted uranium separately in their PAs and assess it as shielding rather than each isotope being calculated into the fission array.

- HQ should work with the NRC to clarify the depleted uranium classification issue.

- DOE should work with Department of Transportation (DOT) on revising the fissile packaging limitations and the availability of DOT Type B containers.

- DOE should resolve the metal recycling moratorium and provide clear guidance on criteria to allow recycling.

- DOE should develop a shipping cask for shipment of U233 waste to an offsite TSDF.

- The revision to DOE O 435.1 should reduce inconsistency of waste characterization requirements among DOE, DOT, and the NRC.

5.1.3 Treatment

Areas of Improvement

- DOE should provide guidance on the use of spraying foam on waste in order to decrease the potential for loose contamination or shifting during transportation.

- DOE should provide guidance to smaller generating sites on how to combine their LLW shipments to reduce shipping costs.

- DOE should provide guidance to sites recommending negotiations with their regulatory agencies to enable approval of existing treatment plans be used for similar waste streams without gaining separate approval.

- DOE O 435.1 treatment requirements should be revised to clarify whether treatment is allowed at the generator facility.

- DOE O 435.1 treatment requirements should be revised to be consistent with appropriate Federal and state hazardous waste regulations.

- DOE O 435.1 treatment requirements should be revised to include a RCRA-type exemption. For example, State regulators have accepted that lead used for shielding or counter-balancing (if not “excessive”) is not RCRA regulated and disposal in a LLW disposal facility is sufficient.

- DOE O 435.1 treatment requirements should be revised to ensure no additional requirements are imposed by the DOE that may increase the administrative burden and costs of the program without sufficient benefit.

- DOE O 435.1 should be revised to require waste form testing (e.g., vibration testing) for liquid waste that has been solidified. Transportation vibration may cause liquid to separate and leak from containers.

5.1.4 Storage

Best Practice

- The storing of like waste together, increasing efficiency in gathering containers for outgoing shipments by reducing container movements.

Areas of Improvement

- DOE O 435.1 should provide guidance recommending the use of drum webs to minimize potential accidents with pressurized containers.

- The storage criteria in DOE O 435.1 should be reevaluated to require measure(s) to prevent water intrusion for LLW storage facilities. Outside, unprotected storage may need to be limited to "staging" time limits.

- DOE O 435.1 staging requirements should consider allowing staging of LLW greater than 90 days if the generator has a valid reason, is approved by the Site Manager, and has a limited-time plan to move the waste to storage, treatment or disposal.

- DOE O 435.1 should allow small volumes of LLW to be stored longer than one year when it is not economical to ship. Small volumes would need to be defined differently than the 11(e)2 small quantity.

- DOE O 435.1 requirements for monitoring waste storage facilities should be updated to current acceptable standards.

5.1.5 Disposal

Areas of Improvement

- LFRG guidance should recommend independent review of draft key disposal authorization documents. Independent reviews conducted prior to final document submittal reduce LFRG review team findings.

- LFRG guidance should recommend the use of probabilistic analysis along with the use of deterministic analysis for evaluating uncertainty and sensitivity in the PA. A hybrid approach using a combination of deterministic and probabilistic modeling approaches has been adopted because it identifies potential errors in each of the models, maintains a deterministic base case calculation to compare with the deterministic performance objectives and addresses the increasing emphasis on probabilistic approaches. Additional guidance is also required for the conduct and interpretation of sensitivity and uncertainty analyses to address the increasing use of a combination of deterministic and probabilistic approaches to quantify uncertainty.

- DOE O 435.1 should be revised to include procedures for determining the impact to the PA and CA when proposed actions or new information is discovered. This approach for evaluating off-normal events and conditions against performance objectives is called the Unreviewed Disposal Question Evaluation. WAC developed for a disposal facility cannot anticipate all wastes to be disposed. Therefore a mechanism for evaluating exceptions has proven to be essential.

- DOE O 435.1 should include specific guidance to crosswalk DOE O 435.1 requirements when in-situ disposition is conducted under a regulation other than DOE O 435.1. Current practices include filling the void space of robust large structures with cement or other fill materials.

- DOE O 435.1 should be revised to provide clarification on regularity of PA and CA revisions.

- DOE O 435.1 should be revised to ensure the PA critical assumptions are protected in site operational procedures.

- DOE O 435.1 specifically identifies minimum monitoring requirement but should be revised to change these requirements to ensure the PA and CA requirements are being met.

- DOE O 435.1 should be revised to acknowledge that the DAS is a Federal permit issued by DOE, as the regulatory authority over DOE radioactive waste.

- DOE O 435.1 should be revised to better integrate closure requirements in CERCLA, RCRA, NDAA 3116 and DOE O 435.1.

- DOE O 435.1 should be revised to expand the requirement for CAs to include all site sources, not just the sources that affect the active LLW disposal facility, in order to provide an overall understanding of the potential exposure to a hypothetical member of the public.

- DOE O 435.1 should be revised to add the definition of a waste disposal facility, and should include the ground underneath the facility to the aquifer and 100 meters from the facility in all directions. Questions have arisen concerning the disposal facility definition, especially concerning shallow land disposal.

- In DOE O 435.1, the definition of "release" at a facility should be revised to state that a release only occurs when it leads to exceeding performance objectives. LLW shallow land disposal facilities expect radionuclides to migrate but also to be protective of the environment and the public.

- The water resource impact performance measure in DOE O 435.1 should be clarified to meet the drinking water standards of EPA/State. The current performance measure requires the PA to include an "assessment of impacts to water resources."

- DOE O 435.1 should clarify what is meant by ALARA associated with the PA or simply delete this requirement. Application of this requirement has caused confusion.

- Site LFRG representatives should be provided guidelines in DOE O 435.1 on when to notify the LFRG of discoveries affecting the PA performance objectives or critical assumptions.

- DOE O 435.1 should clarify the expectations regarding the use of liners for disposal facilities. The question for the need of liners has resulted in uncertainty regarding construction of future disposal facilities.

- The use of operational and interim closures for PA considerations should be added to DOE O 435.1. Operational and interim closures are in use in some facilities and this can lead to on-going conditional approvals of a DAS if a closure plan cannot be finalized. This especially applies to disposal facilities closed under CERCLA or other regulatory authorities, where the closure concept will be negotiated or where final closure is being deferred until the end of institutional controls. In the cases of an interim closure concept, the emphasis should be on maintaining and ensuring that design and other performance requirements identified in the PA are properly transferred to and maintained within the outside regulatory authority.

- DOE O 435.1 should be revised to provide flexibility in characterizing contaminated large equipment for disposition as it is often difficult to characterize within the 90-day staging requirement.

- DOE O 435.1 should be revised to include a de-minimus value, where waste with small amounts of activity could be disposed of in a sanitary landfill at a much smaller cost and still be protective of the environment and the public.

- The time of compliance specified in DOE O 435.1, especially the timeframes for uncertainty and sensitivity analyses, should be re-examined. The current 1000 year time of compliance varies from other regulatory authorities

5.1.6 Crosscutting

Best Practices

- The LLWCB has been useful and effective in addressing several items of interest and providing a forum for sharing information across DOE sites.

- The LFRG has been effective in facilitating review of facility documentation and authorizations for disposal and tank closure.

Areas of Improvement

- DOE O 435.1 characterization processes should be better defined for LLW approaching TRU limits or for projects that must manage TRU and LLW waste streams by active segregation. The process should include a discussion of assay requirements and the accuracy range for distinguishing between TRU and LLW.

- DOE O 435.1 should clarify NNSA responsibilities, particularly as it applies to DASs, PAs, and CAs.

- DOE O 435.1 should be revised to allow for compensatory measures for LLW onsite transport if those measures are protective of the environment and the worker. Adopting DOT regulations for intra-site movement of waste packages should be closely examined for cost vs. benefit when such movement does not introduce the waste into public commerce.

- DOE O 435.1 should be revised to align the definition of "classified waste" to the Information Security Order 470.4-4A. DOE O 435.1 should provide guidance on the disposition of classified MLLW.

- DOE O 435.1 should be revised to ensure consistent application of the requirements for the development of Radiological Waste Management Basis. This revision should include the use of referencing other documents, including the Facility Safety Basis Documents.

- DOE O 435.1 needs to provide additional guidance regarding wastes that cross waste type/regulatory authorities. There is little to no guidance currently in the Order for CERCLA, RCRA, or TSCA waste that is also radioactive.

- DOE O 435.1 requirements should be revised to include CERCLA “to be considered” requirements as applicable to the action. There is inconsistency within the complex for including the Order requirements in the CERCLA documentation when a facility is closed under CERCLA.

- DOE O 435.1 should provide guidance specifically regarding tritium due to its unique properties that make it difficult to manage (e.g., off-gassing issues, cannot do direct assay).

- DOE O 435.1 should provide guidance for legacy wastes that must be treated at offsite commercial TSDs but cannot meet DOT requirements for shipment offsite due to size or radiological characteristics.

- DOE O 435.1 should provide additional guidance for the adequate treatment and disposal of classified waste at DOE and commercial facilities. Details should be included regarding documentation for disposal authority of classified "waste."

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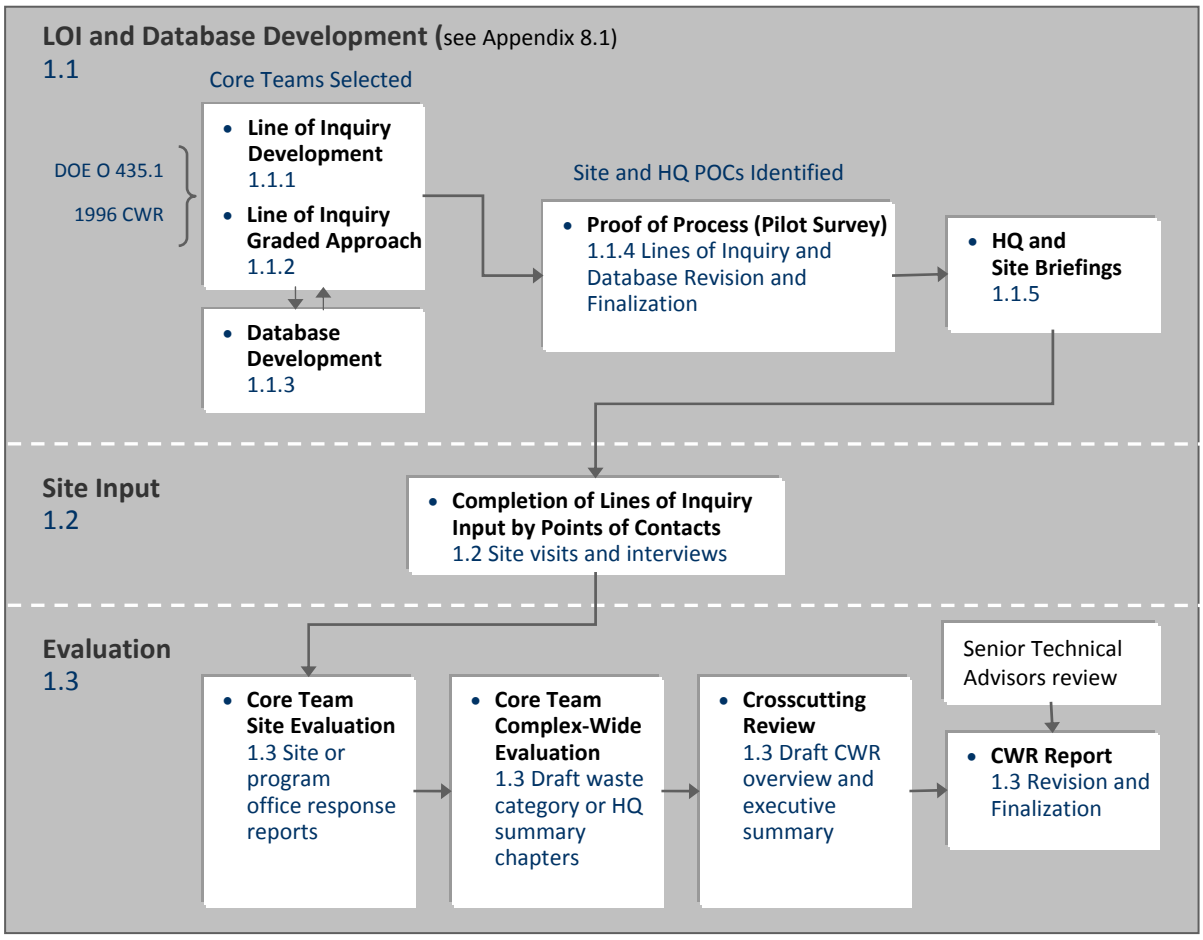
Appendix A. Complex-Wide Review Development Process for Radioactive Waste Management

Introduction

The process for developing the CWR is based upon the feedback and improvement core function of the ISMS process. The feedback and improvement function is categorized by three principal activities: generate and collect data, analyze data and develop information, and improve the process or activity and share the improvement. The CWR satisfies the first two of these principal activities and the third principal activity will be satisfied by providing the results of the CWR to DOE management as input for the update of DOE O 435.1 and to the various corporate boards for consideration.

Flow Diagram for Developing CWR of Radioactive Waste Management



LOIs Development

The first phase of the CWR process was to develop lines of inquiry (Appendix B) using experienced individuals (Federal and contractor) in the field of radioactive waste management. These individuals were part of the waste type and HQ core teams and developed the LOIs in a collaborative and iterative process to ensure they were consistent and comprehensive.

The LOIs were primarily based on DOE M 435.1-1 radioactive waste management requirements for LLW, TRU, HLW, FEM and HQ. Complex-wide vulnerabilities, recommendations and the general approach of the 1996 CWR were used as additional input for the LOIs.

The LOIs were developed based on the four chapters of the DOE M 435.1-1:

- Chapter I- General Requirements and Responsibilities;
- Chapter II- HLW Requirements;
- Chapter III- TRU Requirements; and
- Chapter IV- LLW Requirements.

The waste-type LOIs were divided into sections as depicted in Table 1.1. The HQ LOIs were divided by Program Office as depicted in Table 1.2.

LOIs Development Table 1.1

Site CWR LOIs Category Breakdown Table				
Waste Process Category	Number of questions per LOIs category			
	HLW Management LOIs	**TRU Management LOIs**	**LLW Management LOIs**	**DOE Monitoring Responsibility LOIs**
General	17	20	16	
Generation	43	62	57	
Treatment	34	42	47	
Storage	54	41	52	
Disposal / WIR	14	67	91	
Closure	27			
Crosscutting Areas	31	29	29	
Field Element Manager (Site)				52

LOIs Development Table 1.2

Headquarters CWR LOIs Breakdown Table	
DOE Headquarters Office	**Management Responsibility Category (**Number of questions)
Environmental Management (EM) Program Office	35
General Council Office (GC)	9
Health, Safety & Security (HSS) Support Office	15
Legacy Management (LM) Program Office	13
National Nuclear Security Administration (NNSA)	13
Nuclear Energy (NE) Program Office	13
Science (SC) Program Office	13

Note: A review of the 1996 LLW vulnerabilities was added to the HQ LOIs.

LOIs Graded Approach & Sections

This LOIs organization (Tables 1.1 & 1.2) made it possible to use a "graded approach" for obtaining information concerning waste management activities at any particular site. For example, a small site may only need to complete the general, generation and storage sections for LLW. Conversely, a large site may need to complete all the LOIs for HLW, TRU and LLW.

The number of LOIs a site completed for a particular waste type was designed to be flexible because of the different contractual arrangements involving multiple contractors and/or Program Offices at the various sites. The site POC worked with each core team to decide if one or multiple site responses would be completed for each LOIs. For example, SRS has only one LOI for LLW even though the site has two major contractors and Program Offices. Alternatively, Oak Ridge has five different LOIs responses for LLW because of their multiple contracts and Program Offices that operate on site.

The General section for each LOIs acquired information relating to the contract and Program Office arrangement at the sites. Many of the large sites had one Management and Operating (M&O) contractor when DOE O 435.1 was initially implemented. Currently, many of the large sites (Oak Ridge, SRS, Richland, INL, and NTS) have multiple contractors and Program Offices with radioactive waste management responsibilities.

The Generation, Treatment, Storage and Disposal sections for HLW, TRU, and LLW LOIs were developed for the sites to identify improvements in their program implementation of DOE M 435.1-1. In addition, the vulnerabilities identified in the 1996 LLW CWR were incorporated into all waste type LOIs.

The Crosscutting section was designed to identify issues that crossed boundaries among HLW, TRU and LLW or other regulatory authorities such as the NRC and EPA (CERCLA & RCRA). The Crosscutting section also requested information on the effectiveness of the LFRG and the Tank Closure, LLW and TRU Corporate Boards.

The WIR and Closure sections only apply to the HLW LOIs and were developed for the sites to identify improvements in their program implementation of DOE M 435.1-1.

The HQ and the FEM LOIs were developed to gather information beneficial in updating the responsibilities of radioactive waste management of Program Offices and the FEM.

LOIs Database

The CWR team developed a secure, web-based database to collect, sort and develop reports from a large amount of data. LOIs information was accumulated from 29 LLW sites, 14 TRU sites, 4 HLW sites and 5 Program Offices, and 1 Support Office and recorded in the database. In addition, supporting information (e.g. WM PEIS) that the POC would need to complete the LOIs was made available within the database.

Site POC and core team members were given login names and passwords, as appropriate, to ensure the integrity of the data. POC could only access the LOIs associated with their site. POC could either log onto the server and complete the LOIs in the database or download an Excel spreadsheet to complete the LOIs. Once completed, the spreadsheet would be uploaded into the database. The core team members could only access the information for their area of responsibility (LLW, TRU, HLW, and HQ).

Proof of Process (Pilot Survey)

The effectiveness of the LOIs and the database was tested using Lawrence Berkeley National Laboratory (LBNL) to represent a small site and the Savannah River Site (SRS) to represent a large site. The SRS was selected because of the numerous HLW, TRU & LLW generators onsite, the multiple waste treatment facilities (DOE/commercial) utilized onsite and/or offsite, and the various waste disposal facilities (DOE/commercial) used onsite and/or offsite. The LBNL was selected because of the small amount of LLW & TRU generated and stored at the site.

The core teams revised, clarified, and finalized the LOIs during a lessons-learned meeting after the pilot was conducted. The core teams also identified the need to develop FEM LOIs because all other elements of DOE O 435.1 were included in the CWR. The necessity to conduct telephone interviews and/or site visits to ensure that sufficient information was collected was a lesson learned from the pilot. The LLW Core Team developed talking points for use during telephone interviews with POC to ensure a consistent interpretation of the LOIs by 29 sites across the complex.

The core teams also tested the sorting, segregating, and data reporting functions of the database during the pilot. The core team evaluation resulted in the database being more effective in assisting the team in evaluating the LOIs from the site and complex-wide perspectives.

Headquarters and Site Briefings

Communication was a recognized important component of the evaluation process to ensure a complete understanding by all affected individuals of their roles and responsibilities for the effort being conducted. Briefings were conducted with HQ, Site Management, Corporate Boards, LFRG, EFCOG and site POC explaining the scope, purpose and objectives of the CWR. Lines of communication were developed to ensure that any question that the POC had during the input phase, could be readily answered by a member of the core team, Corporate Board or EFCOG member.

Site Input and Evaluation

The LOIs were sent to the POC for their self-assessment and to provide information to the core teams regarding successes, areas of improvement, lessons learned and best practices. Specific deadlines were established and the core teams monitored site progress. In some cases, the POC had the direct knowledge and experience to complete the LOIs. In other instances (e.g., large sites), the POC obtained the necessary information from multiple sources and combined this information to respond accurately to the LOIs.

The contractors initially completed the LOIs. The site DOE POC were invited to review and comment on the contractors' input in a separate text block within the database but could not revise the contractors' response. This ensured the core team an independent opinion from the contractor and from the DOE. The FEM LOIs was completed by the DOE only.

Evaluation

The core teams visited sites or conducted telephone interviews to review the LOIs responses with the site POC. Sites visited were SRS, OR, RL, ORP, NTS, INL Site, WIPP, and WV. The core teams evaluated the data to identify any successes, areas of improvement, lessons learned and best practices (including suggested revisions to DOE O 435.1) based upon the Chapter 1 definitions and the core team experience. The core teams developed site summaries which include a general description of the site, progress in implementing DOE O 435.1, progress in radioactive waste management, and a listing of the site's successes, areas of improvement, lessons learned and best practices.

The core teams evaluated the site summaries from a complex-wide standpoint by looking at all the site summaries collectively for their particular waste type. The core team grouped the data into the same categories (e.g. general, generation, treatment, storage, disposal, and crosscutting) used for the site evaluation. The core teams, using the same definitions, identified successes, best practices, lessons learned and areas of improvement in each of these categories across all sites for commonalities, trends, or for specific items of interest for improving management of radioactive waste and for updating DOE O 435.1. The core teams integrated all the successes into the best practices category because the responses received were very similar in content. The core team also integrated the lessons learned responses into either best practices or areas of improvement, as appropriate.

The HQ Core Team initially evaluated LOIs responses from HQ program organizations with radioactive waste management responsibilities for successes, best practices, lessons learned and areas of improvement. The HQ Core Team integrated successes and lessons learned into either best practices or areas of improvement similar to the waste type core teams. The core teams also evaluated 1996 CWR LLW vulnerabilities with respect to the current DOE O 435.1 requirements and to the responses to the LOIs.

Complex-wide Review - Sites and Offices Surveyed	LLW	TRU	HLW	HQ
Ames Laboratory	X			
Argonne National Laboratory	X	X		
Brookhaven National Laboratory	X			
Energy Technology Engineering Center	X			
Fermi National Accelerator Laboratory	X			
Fernald Environmental Management Project	X			
Hanford Site	X	X	X	
Idaho National Laboratory Site	X	X	X	
Kansas City Plant	X			
Lawrence Berkeley National Laboratory	X	X		
Lawrence Livermore National Laboratory	X	X		
Los Alamos National Laboratory	X	X		
Mound Site	X			
Nevada Test Site	X	X		
Oak Ridge Reservation	X	X		
Pacific Northwest National Laboratory	X			
Paducah Gaseous Diffusion Plant	X			
Pantex Plant	X			
Portsmouth Gaseous Diffusion Plant	X			
PPPO (Depleted Uranium Hexafluoride Conversion Facilities)	X			
Princeton Plasma Physics Laboratory	X			
Rocky Flats Environmental Technology Site	X			
Sandia National Laboratories	X	X		
Savannah River Site	X	X	X	
Separations Process Research Unit	X			
Stanford Linear Accelerator Center	X			
Thomas Jefferson National Accelerator Facility	X			
Waste Isolation Pilot Plant	X	X		
West Valley Site	X	X	X	
Environmental Management (EM) Program Office				X
Health, Safety & Security (HSS) Support Office				X
Legacy Management (LM) Program Office				X
National Nuclear Security Administration (NNSA)				X
Nuclear Energy (NE) Program Office				X
Science (SC) Program Office				X
Totals	**29**	**12**	**4**	**6**

A crosscutting review team was established that conducted a review across the HLW, LLW, TRU waste types and HQ complex-wide summaries. This review identified the top best practices and areas of improvement for each waste type and HQ. The crosscutting review was conducted using the Federal project director, core team leads and other senior level Federal and contractor personnel. In addition, the Senior Technical Advisors provided an independent perspective that resulted in revision of the top best practices and areas of improvement.

Appendix B. Radioactive Waste Management Complex-Wide Review

Lines of Inquiry

The following is a print out of the DOE Radioactive Waste Management CWR LOIs that were issued to the DOE sites that manage radioactive waste activities. Some are configured as yes or no questions and many are setup for unlimited text responses.

Question Printout Report for: DOE HQ

Page Name	Question Number	Question Text	Answer
HQ			
	Headquarters-01	Has the ASESH approved performance assessments and composite analyses, or appropriate CERCLA documentation for LLW disposal facilities and issuing disposal authorization statements?	No, Yes
	Headquarters-01.01	If Yes, please provide the reference; if No please explain	
	Headquarters-02	Has ASESH conducted independent appraisals and audits of DOE waste management programs?	No, Yes
	Headquarters-02.01	If Yes, please provide the reference; if No please explain	
	Headquarters-03	Has ASESH reviewed HQ Waste Management Plans with regard to compliance with DOE environment, safety, and health requirements?	No, Yes
	Headquarters-03.01	If Yes, please provide the reference; if No please explain	
	Headquarters-04	Has the DASWM developed, implemented and maintained integrate Complex-Wide Radioactive Waste Management Program Plans for the following:	
	Headquarters-04.01	High Level Waste?	No, Yes
	Headquarters-04.01.01	If Yes, please provide the reference; if No please explain	

Question Printout Report for: DOE HQ

	Headquarters-04.02	Transuranic Waste?	No, Yes
	Headquarters-04.02.01	If Yes, please provide the reference; if No please explain	
	Headquarters-04.03	Low-Level Waste?	No, Yes
	Headquarters-04.03.01	If Yes, please provide the reference; if No please explain	
	Headquarters-04.04	Mixed Low-Level Waste?	No, Yes
	Headquarters-04.04.01	If Yes, please provide the reference; if No please explain	
	Headquarters-05	If yes to LOI number 4, does each plan describe the functional elements, organizations, responsibilities, and activities that comprise the system needed to store, treat and dispose of radioactive waste in a manner that is protective of the public, workers, and environment?	No, Yes
	Headquarters-05.001	If Yes, please provide the reference; if No please explain	
	Headquarters-05.01	Does the plan present a waste management strategy that integrates waste projections and life cycle waste management planning into complex-wide facility configuration decisions?	No, Yes
	Headquarters-05.01.01	If Yes, please provide the reference; if No please explain	
	Headquarters-05.02	Does the plan describe the approach to research and technology development being pursued to improve safety and/or efficiency in managing radioactive waste?	No, Yes
	Headquarters-05.02.01	If Yes, please provide the reference; if No please explain	
	Headquarters-06	Has the DASWM established and maintained a system to compile waste generation projection data and other information concerning radioactive waste management facilities, operations, and activities across the complex?	No, Yes
	Headquarters-06.01	If Yes, please provide the reference; if No please explain	

Question Printout Report for: DOE HQ

	Headquarters-07	Has the DASWM & DASER established a review panel, consisting of DOE personnel, to review LLW disposal facility PAs, CAs, and appropriate CERCLA documentation?	No, Yes
	Headquarters-07.0.01	If Yes, please provide the reference; if No please explain	
	Headquarters-07.01	Has this panel recommended LLW disposal facility compliance determinations to the DASWM & DASER?	No, Yes
	Headquarters-07.01.01	If Yes, please provide the reference; if No please explain	
	Headquarters-07.02	Has this panel developed disposal authorizations statements?	No, Yes
	Headquarters-07b1	If Yes, please provide the reference; if No please explain	
	Headquarters-08	Has the DASWM & DASER issued disposal authorization statements containing conditions that LLW disposal facilities must meet in order to operate with an approved radioactive waste management basis?	No, Yes
	Headquarters-08.01	If Yes, please provide the reference; if No please explain	
	Headquarters-09	Has the DASWM & DASER reviewed and approved closure plans and other closure documentation for deactivated HLW facilities/sites and issued authorization for closure activities to proceed?	No, Yes
	Headquarters-09.01	If Yes, please provide the reference; if No please explain	
	Headquarters-10	Have the different Program Offices with radioactive waste management facilities, operations, or activities ensured that the Field Element Managers meet the requirements of DOE O 435.1 and DOE Manual 435.1-1?	No, Yes,
	Headquarters-10.01	If Yes, please provide the reference; if No please explain	
	Headquarters-11	Does documentation exist demonstrating appropriate NEPA analyses has been performed to support waste management activities?	No, Yes,
	Headquarters-11.01	If Yes, please provide the reference; if No please explain	

Question Printout Report for: DOE HQ

	Headquarters-12	Does DOE O 435.1 and associated Manual adequately address the 1996 complex-wide vulnerabilities listed below?	
	Headquarters-12.01	LLW forecasting and capacity planning is inadequate.	
	Headquarters-12.01.01	Current DOE forecasting and capacity planning efforts do not provide adequate information to support effective and integrated planning. This inadequacy results in capacity shortages, program ineffectiveness, and unnecessary storage of LLW, which increases the risk for releases to the environment and exposures to workers and the public.	
	Headquarters-12.01.02	1996 CWR Recommendation	
	Headquarters-12.01.03	The focus of the recommendation is on improving DOE's complex-wide waste forecasting to promote timely development of adequate LLW management capabilities and capacities. Timely development of LLW management capabilities and capacities will reduce indefinite storage of wastes, storage of waste in ad hoc accumulation areas, and generally reduce opportunities for releases to the environment and exposures to workers.	No, Yes,
	Headquarters-12.01.04	If Yes, please provide the reference; if No please explain	
	Headquarters-12.02	Characterization of LLW is ineffective.	
	Headquarters-12.02.01	Inadequacies and inaccuracies in characterization efforts complicate effective waste management activities and planning. Ineffective characterization results in mismatched technologies and increased volumes of waste in storage, and increased risk for releases to the environment and exposures to workers and the public.	
	Headquarters-12.02.02	1996 CWR Recommendation	
	Headquarters-12.02.03	The focus of this recommendation is on improving DOEs characterization requirements and programs by identifying and constructing a level of program consistency that will promote more efficient planning and LLW management activities. Increased compatibility between generation and management needs regarding characterization will reduce indefinite and ad hoc storage of waste and increase the ability to quickly and properly apply the correct LLW management techniques. This would minimize opportunities for releases to the environment and exposure to the workers and the public.	No, Yes,

Question Printout Report for: DOE HQ

	Headquarters-12.02.04	If Yes, please provide the reference; if No please explain	
	Headquarters-12.03	LLW that has an identified path forward for disposal remains in storage.	
	Headquarters-12.03.01	A lack of specific requirements to dispose of LLW, absence of time limits on the storage of LLW, and competing management priorities, result in indefinite storage of LLW even if there is an identified path forward for disposal. Unnecessary storage of LLW often results in increased risk to workers and increased risk of future remediation and clean-up liabilities.	
	Headquarters-12.03.02	1996 CWR Recommendation	
	Headquarters-12.03.03	The focus of this recommendation is also on developing, adopting, and enforcing requirements that promote timely disposition of wastes for which there is an identified path forward for disposal in cases where protracted storage exacerbates the potential for unnecessary exposure or release.	No, Yes,
	Headquarters-12.03.04	If Yes, please provide the reference; if No please explain	
	Headquarters-12.04	Storage conditions for LLW are inadequate.	
	Headquarters-12.04.01	A lack of requirements regarding safe conditions for storage of LLW and poor planning result in increased risk for releases to the environment and exposures to workers and the public. The potential for releases is primarily from deteriorating packages and storage of waste in a manner that is not appropriately protected from natural evens and phenomena based on the inherent risk of the waste stored.	
	Headquarters-12.04.02	1996 CWR Recommendation	
	Headquarters-12.04.03	The focus of this recommendation is on developing requirement for adequate LLW storage conditions and to identify waste streams that do not meet proper management conditions or do not satisfy waste acceptance criteria for existing treatment, storage, and disposal facilities.	No, Yes,
	Headquarters-12.04.04	If Yes, please provide the reference; if No please explain	
	Headquarters-12.05	Some LLW has no technical path forward for disposition.	

Question Printout Report for: DOE HQ

	Headquarters-12.05.01	The lack of a technically feasible or identified path forward for managing some wastes results in indefinite storage and increased risk for releases to the environment and exposures to workers.	
	Headquarters-12.05.02	1996 CWR Recommendation	
	Headquarters-12.05.03	The focus of this recommendation is on prioritizing resources and effort to identify and develop solutions for these wastes. Additionally, continued generation of waste streams with no path forward should be reviewed and justified.	No, Yes,
	Headquarters-12.05.04	If Yes, please provide the reference; if No please explain	
	Headquarters-12.06	Performance assessments are unapproved and lack adequate requirements.	
	Headquarters-12.06.01	Performance assessments for DOE LLW disposal facilities do not consistently address all considerations important to demonstrating compliance with performance objectives. The approval process for performance assessments is cumbersome, and results in a lack of confidence regarding long-term protectiveness.	
	Headquarters-12.06.02	1996 CWR Recommendation	
	Headquarters-12.06.03	The focus of this recommendation is on better definition of the specific approval responsibilities for performance assessments and the development of adequate, comprehensive performance assessment requirements and guidance.	No, Yes,
	Headquarters-12.06.04	If Yes, please provide the reference; if No please explain	
	Headquarters-13	Does DOE O 435.1 and associated Manual adequately address the DNFSB 94-2 Recommendation Findings	No, Yes,
	Headquarters-13.01	DOE had not kept pace with the evolution of commercial practices for waste disposal	No, Yes,
	Headquarters-13.01.01	If Yes, please provide the reference; if No please explain	
	Headquarters-13.02	Six years after the issuance of DOE 5820.2A, the performance assessment process had not been completed for any of DOE's low-level waste disposal facilities	No, Yes,

Question Printout Report for: DOE HQ

	Headquarters-13.02.01	If Yes, please provide the reference; if No please explain	
	Headquarters-13.03	DOE performance assessments excluded waste buried prior to September 1988 and interacting source terms	No, Yes,
	Headquarters-13.03.01	If Yes, please provide the reference; if No please explain	
	Headquarters-13.04	There was considerable uncertainty in the DOE projections of low-level waste volumes	No, Yes,
	Headquarters-13.04.01	If Yes, please provide the reference; if No please explain	
	Headquarters-13.05	DOE needed additional requirements standards, or guidance on LLW management	No, Yes,
	Headquarters-13.05.01	If Yes, please provide the reference; if No please explain	
	Headquarters-13.06	DOE needed to improve its modeling and predictive capability for assessing radionuclide migration, enhancing stability of buried waste forms, deterring intrusion, and inhibiting migration of radionuclides.	No, Yes,
	Headquarters-13.06.01	If Yes, please provide the reference; if No please explain	
	Headquarters-13.07	DOE needed to improve its modeling and predictive capability for assessing radionuclide migration, enhancing stability of buried waste forms, deterring intrusion, and inhibiting migration of radionuclides.	No, Yes,
	Headquarters-13.07.01	If Yes, please provide the reference; if No please explain	
	Headquarters-14	Please list any lessons learned or best practices you have experienced at HQ that would be beneficial to other Program Offices or sites around the Complex.	
	Headquarters-15	What issues (include programmatic, contractual or physical) have you resolved?	
	Headquarters-15.01	How did you resolve them?	
	Headquarters-16	What issues have you encountered that are currently unresolved	

Question Printout Report for: DOE HQ

	Headquarters-16.01	Would a revision to 435.1 assist in resolution?	No, Yes,
	Headquarters-16.02	Please explain the proposed revision and provide a justification.	
	Headquarters-17	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	
	Headquarters-17.01	Please explain the proposed revision and provide a justification.	
	Headquarters-18	Are there any additional feedback concerning DOE O 435.1 and the associated Manual and Guide?	
	Headquarters-19	What are the issues concerning legacy management you would like to see clarified in DOE O 435.1 or in another DOE Directive?	

Question Printout Report for: HLW

Page Name	Question Number	Question Text	Answer
General			
	General-01	Briefly describe the contracting arrangement at your site as it relates to the generation, treatment, storage, and disposal of HLW. (e.g., there are two primary contracts at the SRS. The M&O contractor is responsible for the overall waste management program at the site. The Liquid Waste Contractor is a generator of HLW and LLW and complies with the overall waste management program established by the M&O).	
	General-02	Are there issues associated with or opportunities to improve the contract arrangement with	No, Yes
	General-02.01	If Yes, please describe	
	General-03	Briefly describe the arrangement at your site as it relates to the generation, treatment, storage, and disposal of HLW where various Program Offices are involved. (i.e. several Program Offices (EM, NNSA, SC) are located at the Oak Ridge Reservation). Each of these Program Offices is responsible for the TSD of waste they generate. (N/A if not applicable)	
	General-04	Are there issues associated with or opportunities to improve the Program Office arrangement with respect to radioactive waste management?	No, Yes
	General-04.01	If Yes, please describe	
	General-05	Explain if DOE M435.1-1 provides sufficient information for the generation and disposal of radioactive classified matter.	
	General-06	How do you ensure that waste generated under a classified program is declassified or rendered suitable for unclassified radioactive waste management?	
	General-07	Does your work scope result in the generation of HLW?	No, Yes
	General-07.01	If Yes, list the facilities and/or activities	
	General-08	Does your work scope result in the storage of HLW?	No, Yes

Question Printout Report for: HLW

	General-08.01	If Yes, list the facilities and/or activities	
	General-09	Does your work scope result in the treatment of HLW	onsite, offsite
	General-09.01	If Yes, list the facilities and/or activities	
	General-10	Do you have waste incidental to reprocessing?	No, Yes
	General-11	Do you have any HLW facilities (tanks, tank farms, etc) that are closed or are in the process of being closed?	No, Yes
	General-11.01	If Yes, list the facilities and/or activities	
Generation			
	Generation-01	Do you have waste forecasting tool?	No, Yes
	Generation-01.01	If documented, please provide the procedural reference; if No please explain	
	Generation-02	Has waste generation forecasting negatively affected your ability to timely store, treat or dispose of HLW (i.e., the capacities of the T,S,D facility was exceeded)?	No, Yes
	Generation-02.01	If Yes, please explain	
	Generation-03	Has waste generation forecasting positively impacted your ability to timely store, treat or dispose of HLW (e.g. new treatment capability developed from forecast)	No, Yes
	Generation-03.01	If Yes, please explain.	
	Generation-04	Do you have a process for characterizing HLW?	No, Yes
	Generation-04.01	If documented, please provide a reference to this procedure; if No, please explain the characterization process that is used at your site	

Question Printout Report for: HLW

	Generation-05	Is the generation of HLW at your facility under a documented certification program?	No, Yes
	Generation-05.001	If Yes, please provide the procedural reference that requires generators to use the tool; if No please explain	
	Generation-05.002	If Yes, does the certification program include:	
	Generation-05.01	Designation of officials who have the authority to certify and release waste for shipment?	No, Yes
	Generation-05.01.01	If No, please explain	
	Generation-05.02	Specify what documentation is required for waste generation, characterization, shipment, and certification?	No, Yes
	Generation-05.02.01	If No, please explain	
	Generation-05.03	Requirement for auditability, retrievability, and storage of required documentation and specify the records retention period?	No, Yes
	Generation-05.03.01	If No, please explain	
	Generation-05.04	Certification that HLW will meet the waste acceptance requirements before being transferred to the receiving facility. This certification shall be managed in a manner that maintains its certification status.	No, Yes
	Generation-05.04.01	If No, please explain	
	Generation-06	Does the generation facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Generation-06.01	If Yes, please provide the procedural reference that requires generators to use the tool; if No please explain	
	Generation-07	Do you have a formal generator lessons learned program at your site?	No, Yes
	Generation-07.01	If Yes, please provide the procedural reference that requires generators to use the tool; if No please explain	

Question Printout Report for: HLW

	Generation-08	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex	
	Generation-09	What generation issues (include programmatic, contractual or physical) have you resolved?	
	Generation-09.01	How did you resolve them?	
	Generation-10	What issues have you encountered that are currently unresolved?	
	Generation-10.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Generation-10.02	Please explain the proposed revision and provide justification	
	Generation-11	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	
	Generation-12	Is there any additional feedback concerning DOE O 435.1 associated with the generation requirements such as characterization, certification, sampling, staging, etc?	
	Generation-13	Has a procedure been developed and implemented for identifying and obtaining the DOE Site Manager's approval prior to the generation of waste with no identified path for disposal (i.e. SNF hardware from fuel processing This is an issue for the hardware from electrometallurgical treatment of sodium bonded fuel by NE)?	No, Yes
	Generation-13.01	If Yes, please provide the reference; if No, please explain	
	Generation-14	Does the Site have any waste with no identified path for disposal?	No, Yes
	Generation-14.0.01	If Yes, please explain	
	Generation-14.0.02	If Yes, does the DOE Site Manager’s approval identify the following conditions at a minimum:	
	Generation-14.01	Programmatic need to generate the waste?	No, Yes

Question Printout Report for: HLW

	Generation-14.01.01	If No, please explain	
	Generation-14.02	Characteristics and issues preventing the disposal of the waste?	No, Yes
	Generation-14.02.01	If No, please explain	
	Generation-14.03	Safe storage of the waste until disposal can be achieved?	No, Yes
	Generation-14.03.01	If No, please explain	
	Generation-14.04	Activities and plans for achieving final disposal of the waste?	No, Yes
	Generation-14.04.01	If No, please explain	
	Generation-14.04.02	Please provide documentation of DOE Site Manager's approval of this waste.	
Treatment			
	Treatment-01	What types of HLW treatment do you utilize?	Vitrification, Other
	Treatment-01.01	If Other, please explain	
	Treatment-02	Do you utilize pretreatment for HLW?	No, Yes
	Treatment-02.01	If so, please explain.	
	Treatment-03	Does the onsite treatment facility have a formalized waste acceptance criterion that has to be complied with prior to accepting waste into the facility?	No, Yes
	Treatment-03.01	If Yes, please provide the program reference; if No, please explain	

Question Printout Report for: HLW

	Treatment-04	Does the onsite WAC include:	
	Treatment-04.01	Allowable activities and/or concentrations of specific radionuclides?	No, Yes
	Treatment-04.01.01	If No, please explain	
	Treatment-04.02	Acceptable waste form that ensures the chemical and physical stability of the waste under conditions that might be encountered during transfer, storage, pretreatment, or treatment?	No, Yes
	Treatment-04.02.01	If No, please explain	
	Treatment-04.03	The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.	No, Yes
	Treatment-04.03.01	If No, please explain	
	Treatment-04.04	Pretreatment, treatment, storage, packaging, and other operations shall be designed and implemented in a manner that will ultimately comply with DOE/EM-0093, Waste Acceptance Product Specifications for Vitrified High-Level Waste Forms, or DOE/RW-0351P, Waste Acceptance System Requirements Document, for non-vitrified, immobilized high-level waste?	No, Yes
	Treatment-04.04.01	If No, please explain	
	Treatment-04.05	A process for the disposition of non-conforming waste?	No, Yes
	Treatment-04.05.01	If No, please explain	
	Treatment-05	Does the treatment facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Treatment-05.01	If Yes, please provide the program reference; if No, please explain	

Question Printout Report for: HLW

	Treatment-06	Are there sufficient pre-treatment capabilities onsite to meet your current and future needs?	No, Yes
	Treatment-06.01	If No, please explain	
	Treatment-06.02	If no, what is the waste stream that requires pre-treatment in which no treatment capability exists? Also, provide the reason why the waste stream cannot be pre-treated.	
	Treatment-07	Are there sufficient treatment capabilities onsite to meet your current and future needs?	No, Yes
	Treatment-07.01	If No, please explain	
	Treatment-07.02	If no, what is the waste stream that requires treatment in which no treatment capability exists? Also, provide the reason why the waste stream cannot be treated	
	Treatment-08	Do you have a formal treatment lessons learned program at your site?	No, Yes
	Treatment-08.01	If Yes, please provide the reference; if No, please explain	
	Treatment-09	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex	
	Treatment-10	What treatment issues (include programmatic, contractual or physical) have you resolved?	
	Treatment-10.01	How did you resolve them?	
	Treatment-11	What issues have you encountered that are currently unresolved.	
	Treatment-11.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Treatment-11.02	Please explain the proposed revision and a justification	
	Treatment-12	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	

Question Printout Report for: HLW

	Treatment-13	Is there any additional feedback concerning DOE O 435.1 associated with the treatment requirements such as characterization, certification, sampling, staging, etc?	
Storage			
	Storage-01	Do you have a formal waste acceptance criterion (WAC) for all HLW storage facilities?	No, Yes
	Storage-01.01	If Yes, please provide the reference; if No, please explain	
	Storage-02	Does the WAC include:	
	Storage-02.01	Allowable activities and/or concentrations of specific radionuclides?	No, Yes
	Storage-02.01.01	If No, please explain	
	Storage-02.02	Acceptable waste form that ensures the chemical and physical stability of the waste under conditions that might be encountered during transfer, storage, pretreatment, or treatment?	No, Yes
	Storage-02.02.01	If No, please explain	
	Storage-02.03	The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.	No, Yes
	Storage-02.03.01	If No, please explain	
	Storage-02.04	Pretreatment, treatment, storage, packaging, and other operations shall be designed and implemented in a manner that will ultimately comply with DOE/EM-0093, Waste Acceptance Product Specifications for Vitrified High-Level Waste Forms, or DOE/RW-0351P, Waste Acceptance System Requirements Document, for non-vitrified, immobilized high-level waste?	No, Yes
	Storage-02.04.01	If No, please explain	

Question Printout Report for: HLW

	Storage-02.05	A process for the disposition of non-conforming waste?	No, Yes
	Storage-02.05.01	If No, please explain	
	Storage-03	Is there a formal program/process for inspecting and maintaining container integrity?	No, Yes
	Storage-03.01	If Yes please provide the reference; if No, please explain	
	Storage-04	Has a structural integrity program been established for each leak-tight storage tanks in-service to verify the structural integrity and service life of each tank to meet operational requirements for storage capacity?	No, Yes
	Storage-04.001	If Yes please provide the reference; if No, please explain	
	Storage-04.002	Does the structural integrity program:	
	Storage-04.01	Verify the current leak-tightness and structural strength of each tank in service?	No, Yes
	Storage-04.01.01	If No, please explain	
	Storage-04.02	Identify corrosion, fatigue, and other critical degradation modes?	No, Yes
	Storage-04.02.01	If No, please explain	
	Storage-04.03	Adjust the chemistry of tank waste, calibrating cathodic protection systems, wherever employed, and implement other necessary corrosion protection measures?	No, Yes
	Storage-04.03.01	If No, please explain	
	Storage-04.04	Provide credible projections as to when structural integrity of each tank can no longer be assured?	No, Yes
	Storage-04.04.01	If No, please explain	

Question Printout Report for: HLW

	Storage-04.05	Identify additional controls necessary to maintain an acceptable operating envelope?	No, Yes
	Storage-04.05.01	If No, please explain	
	Storage-05	Has a modified structural integrity program been developed and implemented to identify the safe operational envelope for each HLW storage tank in-service that is known to have leaked, or is suspect?	No, Yes
	Storage-05.001	If Yes, please provide the reference; if No, please explain	
	Storage-05.002	Does the modified structural integrity program:	
	Storage-05.01	Verify the structural strength of each tank in-service which has leaked or is suspect?	No, Yes
	Storage-05.01.01	If No, please explain	
	Storage-05.02	Identify corrosion, fatigue and other critical degradation modes?	No, Yes
	Storage-05.02.01	If No, please explain	
	Storage-05.03	Adjust the chemistry of tank waste, calibrating cathodic protection systems, wherever employed, and implementing other necessary corrosion protection measures?	No, Yes
	Storage-05.03.01	If No, please explain	
	Storage-05.04	Determine which of the tanks that have leaked or are suspect may remain in service by identifying an acceptable safe operating envelope?	No, Yes
	Storage-05.04.01	If No, please explain	
	Storage-05.05	Provide credible projections as to when the acceptable safe operational envelope can no longer be assured?	No, Yes
	Storage-05.05.01	If No, please explain	

Question Printout Report for: HLW

	Storage-05.06	Identify the additional controls necessary to maintain the acceptable safe operational envelope?	No, Yes
	Storage-05.06.01	If No, please explain	
	Storage-06	Does the storage facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Storage-06.01	If Yes, please provide the reference; if No, please explain	
	Storage-07	Are there sufficient storage capabilities to meet your current and future needs?	No, Yes
	Storage-07.01	If No, please explain	
	Storage-08	Do you have a formal storage lessons learned program at your site?	No, Yes
	Storage-08.01	If Yes, please provide the reference	
	Storage-09	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex	
	Storage-10	What storage issues (include programmatic, contractual or physical) have you resolved?	
	Storage-10.01	How did you resolve them?	
	Storage-11	What issues have you encountered that are currently unresolved	No, Yes
	Storage-11.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Storage-11.02	Please explain the proposed revision and provide a justification.	
	Storage-12	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	

Question Printout Report for: HLW

	Storage-13	Is there any additional feedback concerning DOE O 435.1 associated with the storage Requirements?	
Disposal			
	Disposal-00	Disposal of HLW is currently scheduled to be managed in accordance with DOE policy scheduled to be developed by the end of 2009.	
	Disposal-01	Please describe the impacts to your site, if any, for extended storage of treated and untreated waste.	
	WIR-01	Does the site a have a process/procedure to evaluate waste, resulting from the reprocessing of spent nuclear fuel that is determined to be incidental to reprocessing, as TRU or LLW?	No, Yes
	WIR-01a	If Yes, please provide the reference; if No, please explain	
	WIR-02	If an evaluation has been performed, has it been formally documented and approved by the Site Manager and coordinated with EM.	No, Yes
	WIR-02a	If Yes, Provide reference to all WIR Evaluations that have been performed; if No, please explain	
	WIR-03	Do you have a formal WIR lessons learned program at your site?	No, Yes
	WIR-03a	If Yes, please provide the reference; if No please explain	
	WIR-04	What WIR issues (include programmatic, contractual or physical) have you resolved?	
	WIR-04a	How did you resolve them?	
	WIR-05	What issues have you encountered that are currently unresolved?	
	WIR-05a	Would a revision to 435.1 assist in resolution?	No, Yes
	WIR-05b	Please explain the proposed revision and provide a justification.	

Question Printout Report for: HLW

	WIR-06	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	
	WIR-07	Provide explanation in DOE O 435.1 and associated manual and guide of the correlation between DOE M435.1 and NDAA 3116(a)	
Crosscutting			
	Crosscutting-01	Does the Site have a Site-Wide Radioactive Waste Management Program approved by the Site Manager?	No, Yes
	Crosscutting-01.01	If Yes, please provide the procedural reference; if No, please explain	
	Crosscutting-02	Does the Site send HLW to an offsite commercial facility to be treated, stored, or disposed?	No, Yes
	Crosscutting-02.01	If Yes, has an exemption for use of non-DOE facilities been approved by the Site Manager?	No, Yes
	Crosscutting-02.01.01	If Yes, please provide the reference; if No, please explain	
	Crosscutting-02.02	Has DOE-HQ been notified of the exemption?	No, Yes
	Crosscutting-02.02.01	If Yes, please provide the reference; if No please explain	
	Crosscutting-02.03	Has the Health Safety and Security Office (HSS) been consulted prior to the disposal facility exemption being executed?	No, Yes
	Crosscutting-02.03.01	If Yes, please provide the reference; if No, please explain	
	Crosscutting-03	Does DOE M435.1-1 provide sufficient guidance on treatment, storage, or disposal facilities that cross regulatory lines of authority (i.e. CERCLA/RCRA disposal vs. DOE O 435.1 disposal, in-situ D&D, 40CFR191, etc)?	No, Yes
	Crosscutting-03.01	Please provide any recommendations for improvement	

Question Printout Report for: HLW

	Crosscutting-04	Do you have waste characterization issues/vulnerabilities when determining if a waste is HLW, HLW, MHLW, or TRU?	No, Yes
	Crosscutting-04.01	Should more guidance be provided in this area?	No, Yes
	Crosscutting-04.02	Please explain	
	Crosscutting-05	Do you have re-characterization issues when going from one waste type to another? For example, re-classifying waste from HLW to LLW, or TRU to LLW	No, Yes
	Crosscutting-05.001	If Yes, please explain.	
	Crosscutting-05.01	Should more guidance be provided in this area?	No, Yes
	Crosscutting-05.02	If Yes, please explain and provide justification for the recommendation.	
	Crosscutting-06	Has the HLW Corporate Board been effective in identifying and resolving issues at your site as well as crosscutting issues across the Complex?	No, Yes, Unknown,
	Crosscutting-06.01	What recommendations do you have to improve the effectiveness of the HLWCB?	
	Crosscutting-07	Has the Low Level Waste Disposal Facility Federal Review Group (LFRG) been effective in identifying and resolving issues at your site as well as crosscutting issues across the Complex concerning HLW PA and CA issues?	No, Yes, Unknown,
	Crosscutting-07.01	What recommendations do you have to improve the effectiveness of the LFRG?	
	Crosscutting-08	Does your Site have a formal Waste Minimization and Pollution Prevention program?	No, Yes
	Crosscutting-08.01	If Yes, please provide the reference; if No, please explain	
	Crosscutting-09	Does DOE M435.1-1 provide sufficient guidance on how “upsets” are handled at the TSD facility when they cross waste types (HLW, TRU, MHLW) or regulatory authorities (CERCLA, RCRA, TSCA)?	No, Yes

Question Printout Report for: HLW

	Crosscutting-09.01	Please provide any recommendations for improvement	
	Crosscutting-10	Are there any issues that have not been covered in the above responses that you would like to see clarified or improved in the revision to DOE O 435.1 and its associated Manual and Guide?	
	Crosscutting-11	Is the HQ approval process for HLW documentation, such as Waste Form Compliance Plans (WCP's) and Waste Form Qualification Reports (WQR's), effective and timely for your site?	No, Yes
	Crosscutting-11.01	If No, please explain	
	Crosscutting-12	Are there any policy/program recommendations that have not been covered in the above responses that you would like to see clarified or improved in the revision to DOE O 435.1 and its associated Manual and Guide? Please explain and provide a justification for the recommendation.	
	Crosscutting-13	Are there any issues concerning the packaging and transportation of radioactive material you would like to see clarified in DOE O 435.1 or in another DOE Directive?	
Closure			
	Closure-01	Has any deactivated HLW facilities been closed at your facility?	No, Yes
	Closure-01.01	Please list those facilities closed under CERCLA.	
	Closure-01.02	Please list those facilities closed under an Approved Closure Plan.	
	Closure-01.03	Please list those facilities closed under NDAA 3116	
	Closure-02	For those facilities closed under an Approved Closure Plan please answer the following questions:	
	Closure-02.01	Does the plan define the approach and plans by which closure of each facility within the site is to be accomplished?	No, Yes
	Closure-02.01.01	If No, please explain	

Question Printout Report for: HLW

	Closure-02.01.02	Does the plan include, at a minimum:	
	Closure-02.02	Identification of the closure standards/performance objectives to be applied from DOE M 435.1-1, Chapter III or IV?	No, Yes
	Closure-02.02.01	If No, please explain	
	Closure-02.03	A strategy has been developed for allocating waste disposal facility performance objectives from the closure standard identified in the closure plan among the facilities/units to be closed at the site?	No, Yes
	Closure-02.03.01	If No, please explain	
	Closure-02.04	An assessment of the projected performance of each unit to be closed relative to the performance objectives allocated to each unit under the closure plan?	No, Yes
	Closure-02.04.01	If No, please explain	
	Closure-02.05	An assessment of the projected composite performance of all units to be closed at the site relative to the performance objectives and closure standards identified in the closure plan?	No, Yes
	Closure-02.05.01	If No, please explain	
	Closure-02.06	Identify any other relevant closure controls including a monitoring plan, institutional controls, and land use limitations to be maintained in the closure activity?	No, Yes
	Closure-02.06.01	If No, please explain	
	Closure-03	Do you have a formal closure lessons learned program at your site?	No, Yes
	Closure-03.01	If Yes, please provide the reference; if No, please explain	
	Closure-04	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex	

Question Printout Report for: HLW

	Closure-05	What issues/vulnerabilities do you foresee for your future needs?	
	Closure-06	What closure issues (include programmatic, contractual or physical) have you resolved?	
	Closure-06.01	How did you resolve them?	
	Closure-07	What issues have you encountered that are currently unresolved.	
	Closure-07.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Closure-07.02	Please explain the proposed revision and provide a justification.	
	Closure-08	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue and provide justification to the recommendation	
	Closure-09	Is there any additional feedback concerning DOE O 435.1 associated with the closure requirements?	
Field Element			
	Field Element-01	Has the DOE FEM ensured the following responsibilities (delineated in Chapter I of DOE M 435.1-1) are implemented?	
	Field Element-01.01	Developing, documenting, implementing, and maintaining a Site-Wide Radioactive Waste Management Program.	No, Yes
	Field Element-01.01.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.02	Ensuring a radioactive waste management basis is developed and maintained for each DOE radioactive waste management facility, operation and activity and ensuring review and approval of the basis before operations begin.	No, Yes
	Field Element-01.02.01	If yes, provide the reference. If no, please explain.	

Question Printout Report for: HLW

	Field Element-01.03	Ensuring implementation of waste minimization and pollution prevention programs	No, Yes
	Field Element-01.03.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.04	Approval of exemptions for use of non-DOE facilities.	No, Yes
	Field Element-01.04.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.05	Ensuring the management and disposal of radioactive waste resulting from environmental restoration activities, including decommissioning, meet the substantive requirements of DOE M 435.1-1.	No, Yes
	Field Element-01.05.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.06	Ensuring development, review, approval and implementation of the radioactive waste acceptance requirements for facilities that receive waste for storage, treatment, or disposal.	No, Yes
	Field Element-01.06.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.07	Ensuring development, review, approval, and implementation of a program for waste generation planning, characterization, certification, and transfer.	No, Yes
	Field Element-01.07.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.08	Ensuring development, review, approval and implementation of closure plans for radioactive waste management facilities in accordance with the applicable requirements in the waste type chapters of DOE M435.1-1.	No, Yes
	Field Element-01.08.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.09	Ensuring defense-in-depth principles are incorporated where potential uncertainties or vulnerabilities warrant their use when reviewing and approving radioactive waste management activities and documents.	No, Yes
	Field Element-01.09.01	If yes, provide the reference. If no, please explain.	

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	Field Element-01.10	Ensuring oversight of radioactive waste management facilities, operations, and activities is conducted.	No, Yes
	Field Element-01.10.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.11	Ensuring a training and qualification program is implemented for designated radioactive waste management program personnel, and the training is commensurate with job duties and responsibilities.	No, Yes
	Field Element-01.11.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.12	Ensuring ALARA principles for radiation protection are incorporated when reviewing and approving radioactive waste management activities.	No, Yes
	Field Element-01.12.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.13	Ensuring all radioactive waste is stored in a manner that protects the public, workers, and the environment in accordance with a radioactive waste management basis and that the integrity of waste storage is maintained for the expected time of storage and does not compromise meeting the disposal performance objectives for protection of the public and environment when the waste is disposed.	No, Yes
	Field Element-01.13.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.14	Ensuring all radioactive waste requiring treatment is treated in a manner that protects the public, workers, and the environment and in accordance with a radioactive waste management basis.	No, Yes
	Field Element-01.14.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.15	Ensuring all radioactive waste is disposed in a manner that protects the public, workers, and the environment and in accordance with a radioactive waste management basis.	No, Yes
	Field Element-01.15.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.16	Ensuring monitoring is conducted for all radioactive waste management facilities as required.	No, Yes
	Field Element-01.16.01	If yes, provide the reference. If no, please explain.	

Question Printout Report for: HLW

	Field Element-01.17	Ensuring, to the extent practical, radioactive material and waste generated under a program that is classified for national security reasons is declassified or rendered suitable for unclassified radioactive waste management.	No, Yes
	Field Element-01.17.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.18	Ensuring that waste incidental to reprocessing determinations are made by either the “citation” or “evaluation” process.	No, Yes
	Field Element-01.18.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.19	Ensuring a process is developed and implemented for identifying the generation of radioactive waste with no identified path to disposal and reviewing and approving conditions under which radioactive waste with no identified path to disposal may be generated.	No, Yes
	Field Element-01.19.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.20	Ensuring a process exists for proposing, reviewing, approving, and implementing corrective actions when necessary to ensure that the requirements of DOE M435.1-1 are met and to address conditions that are not protective of the public, workers, or the environment.	No, Yes
	Field Element-01.20.01	If yes, provide the reference. If no, please explain.	
	Field Element-02	If the FEM has delegated his/her responsibilities to a direct report or to a contractor, is the delegation formally documented?	No, Yes
	Field Element-02.01	If yes, provide the reference. If no, please explain.	
	Field Element-03	How does the FEM implement the oversight requirements of Chapter I,2.F (10) of DOE M435.1-1?	
	Field Element-03.01	Please explain and provide a reference.	

Question Printout Report for: HLW

	Field Element-04	Briefly describe the contracting arrangement at your site as it relates to the generation, treatment, storage, disposal of LLW. (i.e., there are two primary contracts at the SRS. M&O contractor is responsible for the overall waste management program at the site. The Liquid Waste Contractor is a generator of LLW and complies with the overall waste management program established by SRNS.	
	Field Element-04.01	Are there issues associated with or opportunities to improve the contract arrangement with respect to radioactive waste management activities?	No, Yes
	Field Element-04.02	If Yes, please explain	
	Field Element-05	Briefly describe the arrangement at your site as it relates to the generation, treatment, storage, and disposal of LLW where various Program Offices are involved. (i.e., several Program Offices (EM, NNSA, SC, NE) are located at the Oak Ridge Reservation. Each of these Program Offices is responsible for the TSD of LLW.	
	Field Element-05.01	Are there issues associated with or opportunities to improve the Program Office arrangement with respect to radioactive waste management activities?	No, Yes
	Field Element-05.02	If Yes, please explain	
	Field Element-06	Explain if DOE M435.1-1 provides sufficient information for the generation and disposal of radioactive classified matter.	
	Field Element-07	How do you ensure that waste generated under a classified program is declassified or rendered suitable for unclassified radioactive waste management?	

Question Printout Report for: TRU

Page Name	Question Number	Question Text	Answer
General			
	General-01	Briefly describe the contracting arrangement at your site as it relates to the generation, treatment, storage, disposal of TRU. (i.e., there are two primary contracts at the SRS.M&O contractor is responsible for the overall waste management program at the site. The Liquid Waste Contractor is a generator of HLW and TRU and complies with the overall waste management program established by the M&O)	
	General-02	Are there issues associated with or opportunities to improve the contract arrangement with respect to radioactive waste management activities?	No, Yes
	General-02.01	If Yes, please explain	
	General-03	Briefly describe the arrangement at your site as it relates to the generation, treatment, storage, and disposal of TRU where various Program Offices are involved. (i.e., several Program Offices (EM, NNSA, SC, and NE) are located at the Oak Ridge Reservation. Each of these Program Offices is responsible for the TSD of TRU).	
	General-04	Are there issues associated with or opportunities to improve the Program Office arrangement with respect to radioactive waste management activities?	No, Yes
	General-04.01	If Yes, please explain	
	General-05	Explain if DOE M435.1-1 provides sufficient information for the generation and disposal of radioactive classified matter.	
	General-06	How do you ensure that waste generated under a classified program is declassified or rendered suitable for unclassified radioactive waste management?	
	General-07	Do you have TRU that may be perceived as HLW?	No, Yes

Question Printout Report for: TRU

	General-07.01	If yes, would a change in the definition of HLW be necessary? If so, please explain.	
	General-08	Is your TRU mixed (radioactive and hazardous)?	No, Yes
	General-09	Do you have contact-handled (CH) or remote-handled (RH) waste, or both?	CH, RH, both,
	General-10	Does your work scope result in the generation of TRU?	No, Yes
	General-10.01	If Yes, list the facilities and/or activities	
	General-11	Does your work scope include the storage and/or staging of TRU?	No, Yes
	General-11.01	If Yes, list the facilities and/or activities	
	General-12	Does your work scope include the treatment of TRU?	No, Yes
	General-12.01	If Yes, list the facilities and/or activities	
	General-13	Does your work scope include the disposal (onsite/offsite) of TRU?	No, Yes
	General-13a	If Yes, list the facilities and/or activities	
Generation			
	Generation-01	Do you have a waste generation forecasting tool?	No, Yes
	Generation-01.01	If documented, please provide the procedural reference; if No, please explain	

Question Printout Report for: TRU

	Generation-02	Has waste generation forecasting negatively affected your ability to timely store, treat or dispose of TRU (i.e., the capacities of the TSD facility were exceeded)?	No, Yes
	Generation-02.01	If Yes please explain.	
	Generation-03	Has waste generation forecasting positively impacted your ability to timely store, treat or dispose of TRU (e.g. new treatment capability developed from forecast)	No, Yes
	Generation-03.01	If Yes, please explain.	
	Generation-04	Do you package TRU according to DOE/HQ packaging instructions?	No, Yes
	Generation-04.01	If yes, provide a reference; if no, please explain	
	Generation-05	Do you have a process for characterizing TRU?	No, Yes
	Generation-05.01	If documented, please provide a reference; If No, please explain.	
	Generation-06	Is your process or the entity providing the service for characterizing TRU certified by DOE/CBFO?	No, Yes
	Generation-06.01	If yes, provide a reference; if no, please explain	
	Generation-07	Does the characterization data include:	
	Generation-07.01	Physical and chemical characteristics?	No, Yes
	Generation-07.01.01	If No, please explain	
	Generation-07.02	Volume, including the waste & any stabilization or absorbent media?	No, Yes

Question Printout Report for: TRU

	Generation-07.02.01	If No, please explain	
	Generation-07.03	Weight of the container and contents?	No, Yes
	Generation-07.03.01	If No, please explain	
	Generation-07.04	Identities, activities, & concentrations of major radionuclides?	No, Yes
	Generation-07.04.01	If No, please explain	
	Generation-07.05	Characterization date?	No, Yes
	Generation-07.05.01	If No, please explain	
	Generation-07.06	Generating source?	No, Yes
	Generation-07.06.01	If No, please explain	
	Generation-07.07	Packaging date?	No, Yes
	Generation-07.07.01	If No, please explain	
	Generation-07.08	Any other information which may be needed to prepare and maintain the disposal facility performance assessment or demonstrate compliance with applicable performance objectives?	No, Yes
	Generation-07.08.01	If No, please explain	
	Generation-08	Has a site WAC been developed, documented and implemented to ensure compliance with the receiving facilities waste acceptance criteria?	No, Yes

Question Printout Report for: TRU

	Generation-08.01	If Yes, please provide reference; If No, please explain	
	Generation-09	Does the certification program included:	
	Generation-09.01	Designated officials who have the authority to certify & release waste for shipment?	No, Yes
	Generation-09.01.01	If Yes, provide the reference	
	Generation-09.01.02	If No, please explain	
	Generation-09.02	Specify what documentation is required for waste generation, characterization, shipment, and certification?	No, Yes
	Generation-09.02.01	If No, please explain	
	Generation-09.03	Provide requirements for auditability, retrievability, and storage of required documentation and specify the records retention period?	No, Yes
	Generation-09.03.01	If No, please explain	
	Generation-10	Does the generation facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Generation-10.01	If Yes, provide the reference; if No, please explain	
	Generation-11	Has a procedure been developed and implemented for identifying and obtaining the DOE Site Manager's approval prior to the generation of waste with no identified path for disposal?	No, Yes
	Generation-11.01	If Yes, please provide the program reference; if No, please explain	
	Generation-12	Does the Site have any TRU with no identified path for disposal?	No, Yes

Question Printout Report for: TRU

	Generation-13	If Yes, does the DOE Site Manager's approval identify the following conditions at a minimum:	
	Generation-13.01	Programmatic need to generate the waste?	No, Yes
	Generation-13.01.01	If No, please explain	
	Generation-13.02	Characteristics and issues preventing the disposal of the waste?	No, Yes
	Generation-13.02.01	If No, please explain	
	Generation-13.03	Safe storage of the waste until disposal can be achieved?	No, Yes
	Generation-13.03.01	If No, please explain	
	Generation-13.04	Activities and plans for achieving final disposal of the waste?	No, Yes
	Generation-13.04.01	If No, please explain	
	Generation-13.05	Please provide a reference to the documentation of DOE Site Manager's approval of this waste.	
	Generation-14	Do you have a formal generator lessons learned program at your site?	No, Yes
	Generation-14.01	If Yes, please provide the reference; if No, please explain	
	Generation-15	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex.	
	Generation-16	What generation issues (including programmatic, contractual or physical) have you resolved?	

Question Printout Report for: TRU

	Generation-16.01	How did you resolve them? (i.e. the definition of TRU has changed from >10nCi/g to >100nCi/g. This has resulted in waste designated as TRU in the past to be re-classified as LLW or MLLW).	
	Generation-17	What issues have you encountered that are currently unresolved	
	Generation-17.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Generation-17.02	Please explain the proposed revision and provide a justification.	
	Generation-18	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue.	
	Generation-18.01	Please explain the proposed revision and provide a justification.	
	Generation-19	Is there any additional feedback concerning DOE O 435.1 associated with the generation requirements such as characterization, certification, sampling, staging, etc?	
Treatment			
	Treatment-01	What types of TRU treatment do you utilize?	
	Treatment-01.01	Solidification	Onsite, Offsite, Not applicable,
	Treatment-01.02	Macroencapsulation	Onsite, Offsite, Not applicable,
	Treatment-01.03	Compaction	Onsite, Offsite, Not applicable,

Question Printout Report for: TRU

	Treatment-01.04	Thermal destruction	Onsite, Offsite, Not applicable,
	Treatment-01.05	Other	Onsite, Offsite, Not applicable
	Treatment-01.05.01	If Other, please explain	
	Treatment-02	Does the onsite treatment facility have a documented WAC that has to be complied with prior to accepting waste into the facility?	No, Yes
	Treatment-02.01	If Yes, please provide the procedure reference that requires compliance with the WAC; if No, please explain	
	Treatment-03	Does the offsite treatment facility have a documented WAC that has to be complied with prior to accepting waste into the facility?	No, Yes
	Treatment-03.01	If Yes, please provide the procedure reference that requires compliance with the WAC; if No, please explain	
	Treatment-04	Does the WAC include:	
	Treatment-04.01	Allowable activities and/or concentrations of specific radionuclides?	No, Yes
	Treatment-04.01.01	If No, please explain	
	Treatment-04.02	Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal?	No, Yes
	Treatment-04.02.01	If No, please explain	
	Treatment-04.03	Do you have the ability to package or re-package waste to allow for the use of Real-Time Radiography (RTR) to examine for items prohibited from shipment or disposal?	No, Yes

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	Treatment-04.03.01	If no, do you have the ability to record video of the packaging process to document the final form of the packaged waste?	
	Treatment-04.04	Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance?	No, Yes
	Treatment-04.04.01	If No, please explain	
	Treatment-04.05	Requirement to identify Transuranic waste as defense or non-defense, and limitations on acceptance?	No, Yes
	Treatment-04.05.01	If No, please explain	
	Treatment-04.06	The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.	No, Yes
	Treatment-04.06.01	If No, please explain	
	Treatment-04.07	The receiving facility shall evaluate waste for acceptance, including confirmation that technical and administrative requirements have been met. A process for the disposition of non-conforming waste shall be established.	No, Yes
	Treatment-04.07.01	If No, please explain	
	Treatment-05	Does the treatment facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Treatment-05.01	If Yes, please provide the reference; if No, please explain	

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	Treatment-06	Does the treatment facility have a formal monitoring program that includes, at a minimum, temperature, pressure, radioactivity in ventilation exhaust & liquid effluent streams, and flammable or explosive mixtures of gases?	No, Yes
	Treatment-06.01	If Yes, please provide the reference; if No, please explain	
	Treatment-07	Does the treatment facility include verification (through operating procedures) that passive and active control systems have not failed?	No, Yes
	Treatment-07.01	If Yes, please provide the reference; if No, please explain	
	Treatment-08	Are there sufficient treatment capabilities either onsite/offsite to meet your current and future needs?	No, Yes
	Treatment-08.01	If No what is the waste stream that requires treatment in which no treatment capability exists?	
	Treatment-08.02	Also provide the reason why the waste stream cannot be treated.	
	Treatment-09	Do you have a formal treatment lessons learned program at your site?	No, Yes
	Treatment-09.01	If Yes, please provide the reference; if No, please explain	
	Treatment-10	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex.	
	Treatment-11	What issues have you encountered that are currently unresolved.	
	Treatment-11.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Treatment-11.02	Please explain the proposed revision and provide a justification.	

	Treatment-12	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	
	Treatment-12.01	Please explain the proposed revision and provide a justification.	
	Treatment-13	Is there any additional feedback concerning DOE O 435.1 associated with the treatment requirements such as characterization, certification, sampling, staging, etc?	
Storage			
	Storage-01	Do you store waste	onsite, offsite, both,
	Storage-02	Does the onsite storage facility require compliance with a documented WAC?	No, Yes
	Storage-02.01	If Yes, please provide the reference; if No, please explain	
	Storage-03	Does the offsite storage facility require compliance with a documented WAC?	No, Yes
	Storage-03.01	If Yes, please provide the reference; if No, please explain	
	Storage-04	Do you have a formal WAC for all TRU storage facilities?	No, Yes
	Storage-04.01	If Yes, please provide the program reference; if No, please explain	
	Storage-05	Does the WAC include:	
	Storage-05.01	Allowable activities and/or concentrations of specific radionuclides?	No, Yes
	Storage-05.01.01	If No, please explain	

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	Storage-05.02	Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal?	No, Yes
	Storage-05.02.01	If No, please explain	
	Storage-05.03	Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance?	No, Yes
	Storage-05.03.01	If No, please explain	
	Storage-05.04	Requirement to identify Transuranic waste as defense or non-defense, and limitations on acceptance?	No, Yes
	Storage-05.04.01	If No, please explain	
	Storage-05.05	The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.	No, yes
	Storage-05.05.01	If No, please explain	
	Storage-05.06	The receiving facility shall evaluate waste for acceptance, including confirmation that technical and administrative requirements have been met. A process for the disposition of non-conforming waste shall be established.	No, Yes
	Storage-05.06.01	If No, please explain	
	Storage-06	Does the storage facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Storage-06.01	If Yes, please provide the program reference; if No, please explain	

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	Storage-07	Is there a formal program/process for inspecting and maintaining container integrity?	No, Yes
	Storage-07.01	If Yes, please provide the program reference; if No, please explain	
	Storage-08	Are the TRU storage facilities monitored, as prescribed in the appropriate facility safety analysis, to ensure wastes are maintained in a safe condition?	No, Yes
	Storage-08.01	If Yes, please provide the program reference; if No, please explain	
	Storage-09	Are the liquid TRU storage facilities monitored for liquid level and/or waste volume and significant waste chemistry parameters?	No, Yes
	Storage-09.01	If Yes, please provide the program reference; if No, please explain	
	Storage-10	Do you have retrievable earthen-covered storage?	No, Yes
	Storage-10.01	If Yes, have plans for removing the Transuranic waste been established and maintained to ensure retrieval activities are protective of workers	No, Yes
	Storage-11	Are there sufficient storage capabilities either onsite/offsite to meet your current and future needs?	No, Yes
	Storage-11.01	If No, please explain	
	Storage-12	Do you have a formal storage lessons learned program at your site?	No, Yes
	Storage-12.01	If Yes, please provide the reference; if No, please explain	
	Storage-13	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex.	

	Storage-14	What issues have you encountered that are currently unresolved.	
	Storage-14.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Storage-14.02	Please explain the proposed revision and provide a justification.	
	Storage-15	What would be required at your site to expand your TRU storage capability to accumulate waste in its final packaged form to allow for waste shipments to be campaigned (periodic increased shipments to allow movement of a limited number of mobile loading teams from site-to-site)?	
	Storage-16	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue.	
	Storage-16.01	Please explain the proposed revision and provide a justification.	
	Storage-17	Is there any additional feedback concerning DOE O 435.1 associated with the storage requirements such as characterization, certification, sampling, staging, etc?	
Disposal			
	Disposal-Offsite-01	Do you send all TRU to WIPP?	No, Yes
	Disposal-Offsite-02	Will you be required to re-package or remove waste items from containers to meet the WIPP requirements for disposal?	No, Yes
	Disposal-Offsite-02.01	If Yes, please provide the percentage of your TRU required to be reworked.	
	Disposal-Offsite-03	Does your TRU have any liquids (including smaller inner containers)?	No, Yes
	Disposal-Offsite-04	Is your TRU in a 55-gallon or 30-gallon drum?	No, Yes

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	Disposal-Offsite-04.01	If No, will you size reduce or re-package into 55 or 30-gallon drums?	
	Disposal-Onsite	If you dispose of TRU in an onsite TRU disposal facility, please answer the following questions:	
	Disposal-Onsite-01	Does the disposal facility meet the requirements of 40 CFR Part 191?	No, Yes
	Disposal-Onsite-01.01	If Yes, please provide the reference; if No, please explain	
	Disposal-Onsite-02	Does the facility have an approved Disposal Authorization Statement?	No, Yes
	Disposal-Onsite-02.01	If yes, provide the date approved	
	Disposal-Onsite-02.02	If yes, how many revisions have been made?	
	Disposal-Onsite-02.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-03	Does the facility have an approved Performance Assessment (PA)?	No, Yes
	Disposal-Onsite-03.01	If yes, provide the date approved	
	Disposal-Onsite-03.02	If yes, how many revisions have been made?	
	Disposal-Onsite-03.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-04	Are the significant PA uncertainties and/or sensitivities, as appropriate, included in the PA and CA Maintenance Plan?	No, Yes
	Disposal-Onsite-04.01	If Yes, please provide the reference; if No please explain	

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	Disposal-Onsite-05	Does the facility have an approved PA and CA Maintenance Plan?	No, Yes
	Disposal-Onsite-05.01	If yes, provide the date approved	
	Disposal-Onsite-05.02	If yes, how many revisions have been made?	
	Disposal-Onsite-05.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-06	Does the facility have an approved Closure Plan?	No, Yes
	Disposal-Onsite-06.01	If yes, provide the date approved	
	Disposal-Onsite-06.02	If yes, how many revisions have been made?	
	Disposal-Onsite-06.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-07	Does the facility have an approved Monitoring Plan?	No, Yes
	Disposal-Onsite-07.01	If yes, provide the date approved	
	Disposal-Onsite-07.02	If yes, how many revisions have been made?	
	Disposal-Onsite-07.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-08	Does the Monitoring Plan use inputs from the PA and CA to identify specific radionuclides to be monitored?	No, Yes
	Disposal-Onsite-08.01	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-09	Has the disposal facility ever exceeded the performance objectives delineated in 40 CFR Part 191?	No, Yes

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	Disposal-Onsite-09.01	If Yes, please explain	
	Disposal-Onsite-10	Does the facility waste acceptance criterion include:	
	Disposal-Onsite-10.01	Allowable activities and/or concentrations of specific radionuclides?	No, Yes
	Disposal-Onsite-10.01.01	If No, please explain	
	Disposal-Onsite-10.02	Is your TRU high in neutron energy?	No, Yes
	Disposal-Onsite-10.03	Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal?	No, Yes
	Disposal-Onsite-10.03.01	If No, please explain	
	Disposal-Onsite-10.04	Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance?	No, Yes
	Disposal-Onsite-10.04.01	If No, please explain	
	Disposal-Onsite-10.05	Requirement to identify Transuranic waste as defense or non-defense, and limitations on acceptance?	No, Yes
	Disposal-Onsite-10.05.01	If No, please explain	
	Disposal-Onsite-10.06	The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.	No, Yes

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	Disposal-Onsite-10.06.01	If No, please explain	
	Disposal-Onsite-10.07	The receiving facility shall evaluate waste for acceptance, including confirmation that technical and administrative requirements have been met. A process for the disposition of non-conforming waste shall be established.	No, Yes
	Disposal-Onsite-10.07.011	If No, please explain	
	Disposal-Onsite-10.08	Inputs from the PA and CA to establish limits?	No, Yes
	Disposal-Onsite-10.08.01	If No, please explain	
	Disposal-Onsite-11	Does the facility have a program/procedure for identifying, tracking, and resolving problems and/or vulnerabilities associated with the DAS (i.e. Unreviewed Disposal Question, WAC Exemption, etc)?	No, Yes
	Disposal-Onsite-11.01	If Yes, please provide the reference; if No, please explain	
	Disposal-Onsite-12	Does the disposal facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Disposal-Onsite-12.01	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-13	Are there sufficient disposal capabilities to meet your current and future needs?	No, Yes
	Disposal-Onsite-13.01	If No, please explain	
	Disposal-Onsite-14	What are the major issues/vulnerabilities (include programmatic, contractual or physical) concerning PA development/maintenance that you have for your site?	

	Disposal-Onsite-15	Do you have a formal disposal lessons learned program at your site?	No, Yes
	Disposal-Onsite-15.01	If Yes, please provide the reference	
	Disposal-Onsite-15.02	If No, please explain	
	Disposal-Onsite-16	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex.	
	Disposal-Onsite-17	What are the major issues/vulnerabilities (include programmatic, contractual or physical) for PA that should be addressed by Policy or through the Directive system?	
	Disposal-Onsite-18	What issues have you encountered that are currently unresolved.	
	Disposal-Onsite-18.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Disposal-Onsite-18.02	Please explain the proposed revision and provide a justification.	
	Disposal-Onsite-19	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue.	
	Disposal-Onsite-19.01	Please explain the proposed revision and provide a justification.	
	Disposal-Onsite-20	Is there any additional feedback concerning DOE O 435.1 associated with the disposal requirements such as characterization, certification, sampling, staging, etc?	
Crosscutting			
	Crosscutting-01	Does the Site have a Site-Wide Radioactive Waste Management Program approved by the Site Manager?	No, Yes

Question Printout Report for: TRU

	Crosscutting-01.01	If Yes, please provide the reference; if No please explain	
	Crosscutting-02	Does DOE M435.1-1 provide sufficient guidance on treatment, storage, or disposal facilities that cross regulatory lines of authority (i.e. CERCLA/RCRA disposal vs. DOE O 435.1 disposal, in-situ D&D, 40CFR191, etc)?	No, Yes
	Crosscutting-02.01	Please provide any recommendations for improvement	
	Crosscutting-03	Does the Site send TRU to an offsite commercial facility to be treated, stored, or disposed?	No, Yes
	Crosscutting-03.01	If yes, has an exemption for use of non-DOE facilities been approved by the Site Manager?	No, Yes
	Crosscutting-03.01.01	If Yes, please provide the reference; if No, please explain	
	Crosscutting-03.02	Has DOE-HQ been notified of the exemption?	No, Yes
	Crosscutting-03.02.01	If Yes, please provide the reference; if No, please explain	
	Crosscutting-03.03	Has HS been consulted prior to the disposal facility exemption being executed?	No, Yes
	Crosscutting-03.03.01	If Yes, please provide the reference; if No, please explain	
	Crosscutting-04	Do you have waste characterization issues when determining if a waste is HLW, TRU, MTRU, or TRU?	No, Yes
	Crosscutting-04.00.01	If Yes, please explain	
	Crosscutting-04.01	Should more guidance be provided in this area?	No, Yes
	Crosscutting-04.01.01	If Yes, please explain	

Question Printout Report for: TRU

	Crosscutting-05	Do you have re-characterization issues when going from one waste type to another? For example, re-classifying waste from HLW to TRU, or TRU to LLW?	No, Yes
	Crosscutting-05.01	Should more guidance be provided in this area?	No, Yes
	Crosscutting-05.02	If Yes, please explain and provide a justification for your recommendation.	
	Crosscutting-06	Has the TRU Corporate Board been effective in identifying and resolving issues at your site as well as crosscutting issues across the Complex?	No, Yes, Unknown,
	Crosscutting-06.01	What recommendations do you have to improve the effectiveness of the TRUCB?	
	Crosscutting-07	Has the LLW Disposal Facility Federal Review Group (LFRG) been effective in identifying and resolving issues at your site (concerning TRU onsite disposal) as well as crosscutting issues across the Complex concerning PA and CA issues?	No, Yes, Unknown,
	Crosscutting-07.01	What recommendations to you have to improve the effectiveness of the LFRG	
	Crosscutting-08	What recommendations do you have to improve the Waste Information Management System (WIMS)?	
	Crosscutting-09	Does your Site have a formal Waste Minimization and Pollution Prevention program?	No, Yes
	Crosscutting-09.01	If Yes, please provide the reference; if No please explain	
	Crosscutting-10	Does DOE M435.1-1 provide sufficient guidance on how “upsets” are handled at the TSD facility when they cross waste types (HLW, TRU, MTRU) or regulatory authorities (CERCLA, RCRA, TSCA)?	No, Yes
	Crosscutting-10.01	Please provide any recommendations for improvement	

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	Crosscutting-11	Are there any issues that have not been covered in the above responses that you would like to see clarified or improved in the revision to DOE O 435.1 and its associated Manual and Guide?	
	Crosscutting-12	Are there any issues concerning the packaging and transportation of radioactive material you would like to see clarified in DOE O 435.1 or in another DOE Directive?	
Field Element			
	Field Element-01	Has the DOE FEM ensured the following responsibilities (delineated in Chapter I of DOE M 435.1-1) are implemented?	
	Field Element-01.01	Developing, documenting, implementing, and maintaining a Site-Wide Radioactive Waste Management Program.	No, Yes
	Field Element-01.01.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.02	Ensuring a radioactive waste management basis is developed and maintained for each DOE radioactive waste management facility, operation and activity and ensuring review and approval of the basis before operations begin.	No, Yes
	Field Element-01.02.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.03	Ensuring implementation of waste minimization and pollution prevention programs	No, Yes
	Field Element-01.03.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.04	Approval of exemptions for use of non-DOE facilities.	No, Yes

	Field Element-01.04.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.05	Ensuring the management and disposal of radioactive waste resulting from environmental restoration activities, including decommissioning, meet the substantive requirements of DOE M 435.1-1.	No, Yes
	Field Element-01.05.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.06	Ensuring development, review, approval and implementation of the radioactive waste acceptance requirements for facilities that receive waste for storage, treatment, or disposal.	No, Yes
	Field Element-01.06.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.07	Ensuring development, review, approval, and implementation of a program for waste generation planning, characterization, certification, and transfer.	No, Yes
	Field Element-01.07.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.08	Ensuring development, review, approval and implementation of closure plans for radioactive waste management facilities in accordance with the applicable requirements in the waste type chapters of DOE M435.1-1.	No, Yes
	Field Element-01.08.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.09	Ensuring defense-in-depth principles are incorporated where potential uncertainties or vulnerabilities warrant their use when reviewing and approving radioactive waste management activities and documents.	No, Yes

	Field Element-01.09.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.10	Ensuring oversight of radioactive waste management facilities, operations, and activities is conducted.	No, Yes
	Field Element-01.10.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.11	Ensuring a training and qualification program is implemented for designated radioactive waste management program personnel, and the training is commensurate with job duties and responsibilities.	No, Yes
	Field Element-01.11.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.12	Ensuring ALARA principles for radiation protection are incorporated when reviewing and approving radioactive waste management activities.	No, Yes
	Field Element-01.12.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.13	Ensuring all radioactive waste is stored in a manner that protects the public, workers, and the environment in accordance with a radioactive waste management basis and that the integrity of waste storage is maintained for the expected time of storage and does not compromise meeting the disposal performance objectives for protection of the public and environment when the waste is disposed.	No, Yes
	Field Element-01.13.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.14	Ensuring all radioactive waste requiring treatment is treated in a manner that protects the public, workers, and the environment and in accordance with a radioactive waste management basis.	No, Yes

	Field Element-01.14.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.15	Ensuring all radioactive waste is disposed in a manner that protects the public, workers, and the environment and in accordance with a radioactive waste management basis.	No, Yes
	Field Element-01.15.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.16	Ensuring monitoring is conducted for all radioactive waste management facilities as required.	No, Yes
	Field Element-01.16.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.17	Ensuring, to the extent practical, radioactive material and waste generated under a program that is classified for national security reasons is declassified or rendered suitable for unclassified radioactive waste management.	No, Yes
	Field Element-01.17.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.18	Ensuring that waste incidental to reprocessing determinations are made by either the “citation” or “evaluation” process.	No, Yes
	Field Element-01.18.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.19	Ensuring a process is developed and implemented for identifying the generation of radioactive waste with no identified path to disposal and reviewing and approving conditions under which radioactive waste with no identified path to disposal may be generated.	No, Yes
	Field Element-01.19.01	If yes, provide the reference. If no, please explain.	

Question Printout Report for: TRU

	Field Element-01.20	Ensuring a process exists for proposing, reviewing, approving, and implementing corrective actions when necessary to ensure that the requirements of DOE M435.1-1 are met and to address conditions that are not protective of the public, workers, or the environment.	No, Yes
	Field Element-01.20.01	If yes, provide the reference. If no, please explain.	
	Field Element-02	If the FEM has delegated his/her responsibilities to a direct report or to a contractor, is the delegation formally documented?	No, Yes
	Field Element-02.01	If yes, provide the reference. If no, please explain.	
	Field Element-03	How does the FEM implement the oversight requirements of Chapter I,2.F (10) of DOE M435.1-1?	
	Field Element-03.01	Please explain and provide a reference.	
	Field Element-04	Briefly describe the contracting arrangement at your site as it relates to the generation, treatment, storage, disposal of LLW. (i.e., there are two primary contracts at the SRS. M&O contractor is responsible for the overall waste management program at the site. The Liquid Waste Contractor is a generator of LLW and complies with the overall waste management program established by SRNS.	
	Field Element-04.01	Are there issues associated with or opportunities to improve the contract arrangement with respect to radioactive waste management activities?	No, Yes
	Field Element-04.02	If Yes, please explain	
	Field Element-05	Briefly describe the arrangement at your site as it relates to the generation, treatment, storage, and disposal of LLW where various Program Offices are involved. (i.e., several Program Offices (EM, NNSA, SC, NE) are located at the Oak Ridge Reservation. Each of these Program Offices is responsible for the TSD of LLW.	

Question Printout Report for: TRU

	Field Element-05.01	Are there issues associated with or opportunities to improve the Program Office arrangement with respect to radioactive waste management activities?	No, Yes
	Field Element-05.02	If Yes, please explain	
	Field Element-06	Explain if DOE M435.1-1 provides sufficient information for the generation and disposal of radioactive classified matter.	
	Field Element-07	How do you ensure that waste generated under a classified program is declassified or rendered suitable for unclassified radioactive waste management?	

Question Printout Report for: LLW

Page Name	Question Number	Question Text	Answer
General			
	General-01	Briefly describe the contracting arrangement at your site as it relates to the generation, treatment, storage, disposal of LLW. (i.e., there are two primary contracts at the SRS. M&O contractor is responsible for the overall waste management program at the site. The Liquid Waste Contractor is a generator of LLW and complies with the overall waste management program established by SRNS.	
	General-02	Are there issues associated with or opportunities to improve the contract arrangement with respect to radioactive waste management activities?	No, Yes
	General-02.01	If Yes, please explain	
	General-03	Briefly describe the arrangement at your site as it relates to the generation, treatment, storage, and disposal of LLW where various Program Offices are involved. (i.e., several Program Offices (EM, NNSA, SC, NE) are located at the Oak Ridge Reservation. Each of these Program Offices is responsible for the TSD of LLW.	
	General-04	Are there issues associated with or opportunities to improve the Program Office arrangement with respect to radioactive waste management activities?	No, Yes
	General-04.01	If Yes, please explain	
	General-05	Explain if DOE M435.1-1 provides sufficient information for the generation and disposal of radioactive classified matter.	
	General-06	How do you ensure that waste generated under a classified program is declassified or rendered suitable for unclassified radioactive waste management?	
	General-07	Does your work scope result in generation of LLW?	No, Yes

Question Printout Report for: LLW

	General-07.01	If yes, list the facilities and/or activities.	
	General-08	Does your work scope include staging and or storing of LLW (including storage for radioactive decay)?	No, Yes
	General-08.01	If yes, list the facilities and/or activities.	
	General-09	Does your work scope include treatment of LLW (onsite/offsite)?	No, Yes
	General-09.01	If yes, list the facilities and/or activities.	
	General-10	Does your work scope include disposal (onsite/offsite) of LLW?	No, Yes
	General-10.01	If yes, list the facilities and/or activities.	
Generation			
	Generation-01	Do you have a waste forecasting tool?	No, Yes
	Generation-01.01	If documented, please provide the reference; if No please explain.	
	Generation-02	Has waste generation forecasting negatively impacted your ability to timely store, treat or dispose of LLW (i.e., the capacities of the T, S, D facility was exceeded)?	No, Yes
	Generation-02.01	If Yes, please explain.	
	Generation-03	Has waste generation forecasting positively impacted your ability to timely store, treat or dispose of LLW (e.g. new treatment capability developed from forecast)	No, Yes
	Generation-03.01	If Yes, please explain.	

Question Printout Report for: LLW

	Generation-04	Do you have a process for characterizing LLW?	No, Yes
	Generation-04.001	As a Minimum, does the Waste Characterization data include:	
	Generation-04.01	Physical and chemical characteristics	No, Yes
	Generation-04.01.01	If No, please explain	
	Generation-04.02	Volume, including the waste and any stabilization or absorbent media;	No, Yes
	Generation-04.02.01	If No, please explain	
	Generation-04.03	Weight of the container and contents;	No, Yes
	Generation-04.03.01	If No, please explain	
	Generation-04.04	Identities, activities, and concentrations of major radionuclides;	No, Yes
	Generation-04.04.01	If No, please explain	
	Generation-04.05	Characterization date;	No, Yes
	Generation-04.05.01	If No, please explain	
	Generation-04.06	Generating source;	No, Yes
	Generation-04.06.01	If No, please explain	

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	Generation-04.07	Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives;	No, Yes
	Generation-04.07.01	If No, please explain	
	Generation-04.08	If characterization process is documented, please provide the reference; if No please explain	
	Generation-05	Is the generation of LLW at your facility under a documented certification program?	Onsite, offsite, or both?
	Generation-06	Is the certification program	onsite, offsite, DOE, commercial facility, combination
	Generation-06.01	Please explain	
	Generation-07	Does the certification program include:	
	Generation-07.01	Designation of the officials who have the authority to certify and release waste for shipment	No, Yes
	Generation-07.01.01	If No, please explain	
	Generation-07.02	Specify what documentation is required for waste generation, characterization, shipment and certification	No, Yes
	Generation-07.02.01	If No, please explain	
	Generation-07.03	Requirements for auditability, retrievability, and storage of required documentation and specify records retention period	No, Yes

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	Generation-07.03.01	If No, please explain	
	Generation-08	Does the generation facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Generation-08.01	If Yes, please provide reference; if No, please explain	
	Generation-09	Has a process been developed and implemented for identifying and obtaining the Site Managers approval prior to the generation of waste with no identified path for disposal?	No, Yes
	Generation-09.01	If Yes, please provide the program reference; if No, please explain	
	Generation-10	Does the Site have any waste with no identified path for disposal?	No, Yes
	Generation-11	If Yes, does the Site Manager's approval identify the following conditions at a minimum:	
	Generation-11.01	Programmatic need to generate the waste?	No, Yes
	Generation-11.01.01	If No, please explain	
	Generation-11.02	Characteristics and issues preventing the disposal of the waste?	No, Yes
	Generation-11.02.01	If No, please explain	
	Generation-11.03	Safe storage of the waste until disposal can be achieved?	No, Yes
	Generation-11.03.01	If No, please explain	
	Generation-11.04	Activities and plans for achieving final disposal of the waste?	No, Yes

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	Generation-11.04.01	If No, please explain	
	Generation-12	Please provide a reference to the documentation of Site Manager's approval of this waste (i.e. a letter from Site Management to the contractor)	
	Generation-13	Do you have a formal generator lessons learned program at your site?	No, Yes
	Generation-13.01	If Yes, please provide reference; if No, please explain	
	Generation-14	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex.	
	Generation-15	What generation issues (include programmatic, contractual or physical) have you resolved?	
	Generation-16	What issues/vulnerabilities (including programmatic, contractual or physical) do you foresee for future needs?	
	Generation-16.01	How did you resolve them? (i.e. A National Lab has a Work for Others program that will generate LLW from the activity. The contract requires the Lab to dispose of the waste. However, the waste cannot be disposed of onsite and does not meet the transportation requirements of 49CFR and does not have a path for disposal).	
	Generation-17	What issues have you encountered that are currently unresolved?	
	Generation-17.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Generation-17.02	Please explain the proposed revision and provide a justification.	
	Generation-18	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	
	Generation-18.01	Please explain the proposed revision and provide a justification.	

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	Generation-19	Is there any additional feedback concerning DOE O 435.1 associated with the generation requirements such as characterization, certification, sampling, staging, etc	
Treatment			
	Treatment-01	Is LLW treated	Onsite, Offsite, No need to treat LLW ,
	Treatment-01.01	If onsite, please list the facilities	
	Treatment-02	Does the onsite treatment facility(ies) require compliance with a documented WAC?	No, Yes
	Treatment-02.01	If Yes, please provide the procedure reference that requires compliance; if No, please explain	
	Treatment-03	Does the offsite treatment facility require compliance with a documented WAC?	No, Yes
	Treatment-03.01	If Yes, please provide the procedure reference that requires compliance; if No, please explain	
	Treatment-04	If LLW is treated on site, does the WAC include:	
	Treatment-04.01	Allowable activities and/or concentrations of specific radionuclides	No, Yes
	Treatment-04.01.01	If No, please explain	
	Treatment-04.02	Acceptable waste form and/or container requirements	No, Yes
	Treatment-04.02.01	If No, please explain	
	Treatment-04.03	Restrictions or prohibitions on waste, materials, or containers	No, Yes

	Treatment-04.03.01	If No, please explain	
	Treatment-04.04	Void spaces within the waste	No, Yes
	Treatment-04.04.01	If No, please explain	
	Treatment-04.05	free liquid restrictions	No, Yes
	Treatment-04.05.01	If No, please explain	
	Treatment-04.06	detonation, explosive, and reaction restrictions	No, Yes
	Treatment-04.06.01	If No, please explain	
	Treatment-04.07	radiolysis or biodegradation gas generation	No, Yes
	Treatment-04.07.01	If No, please explain	
	Treatment-04.08	gaseous form limitation	No, Yes
	Treatment-04.08.01	If No, please explain	
	Treatment-04.09	exception process	No, Yes
	Treatment-04.09.01	If No, please explain	
	Treatment-04.10	waste evaluation for acceptance	No, Yes
	Treatment-04.10.01	If No, please explain	

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	Treatment-04.11	disposition of non-conforming process	No, Yes
	Treatment-04.11.01	If No, please explain	
	Treatment-05	Does the treatment facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Treatment-05.01	If Yes, please provide the reference; if No, please explain	
	Treatment-06	Are there sufficient treatment capabilities either onsite/offsite to meet your current and future needs?	No, Yes
	Treatment-06.01	If No please explain.	
	Treatment-07	Have you or are you planning to close a LLW treatment unit?	No, Yes
	Treatment-07.01	If yes, under what regulatory authority(ies) is the radioactive portion of the facility closed? (e.g., CERCLA, NEPA, RCRA, Federal FFCA)	
	Treatment-08	Have you or are you planning to close a MLLW treatment unit?	No, Yes
	Treatment-08.01	If yes, under what regulatory authority(ies) is the radioactive portion of the facility closed? (e.g., CERCLA, NEPA, RCRA, Federal FFCA)	
	Treatment-09	Do you have a formal treatment lessons learned program at your site?	No, Yes
	Treatment-09.01	If Yes, please provide the reference; if No, please explain	
	Treatment-10	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex.	

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	Treatment-11	What treatment issues (include programmatic, contractual or physical) have you resolved?	
	Treatment-11.01	How did you resolve them? (i.e. a new treatment was developed for a waste that was previously	
	Treatment-12	What issues have you encountered that are currently unresolved.	
	Treatment-12.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Treatment-12.02	Please explain the proposed revision and provide a justification.	
	Treatment-13	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue.	
	Treatment-13.01	Please explain the proposed revision and provide justification.	
	Treatment-14	Is there any additional feedback concerning DOE O 435.1 associated with the treatment requirements such as exemption requirements for using commercial treatment facilities, etc?	
Storage			
	Storage-01	Do you store waste	onsite, offsite, both,
	Storage-02	Does the onsite storage facility require compliance with a documented WAC?	No, Yes
	Storage-02.01	If Yes, please provide the procedure reference that requires compliance; if No, please explain	
	Storage-03	Does the offsite storage facility require compliance with a documented WAC?	No, Yes
	Storage-03.01	If Yes, please provide the procedure reference that requires compliance; if No, please explain	

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	Storage-04	Do you have a formal WAC for all LLW storage facilities?	No, Yes
	Storage-04.01	If Yes, please provide the program reference; if No, please explain	
	Storage-05	Does the WAC include:	
	Storage-05.01	Allowable activities and/or concentrations of specific radionuclides	No, Yes
	Storage-05.01.01	If No, please explain	
	Storage-05.02	Acceptable waste form and/or container requirements	No, Yes
	Storage-05.02.01	If No, please explain	
	Storage-05.03	Restrictions or prohibitions on waste, materials, or containers	No, Yes
	Storage-05.03.01	If No, please explain	
	Storage-05.04	Void spaces within the waste	No, Yes
	Storage-05.04.01	If No, please explain	
	Storage-05.05	free liquid restrictions	No, Yes
	Storage-05.05.01	If No, please explain	
	Storage-05.06	detonation, explosive, and reaction restrictions	No, Yes
	Storage-05.06.01	If No, please explain	

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	Storage-05.07	radiolysis or biodegradation gas generation	No, Yes
	Storage-05.07.01	If No, please explain	
	Storage-05.08	gaseous form limitation	No, Yes
	Storage-05.08.01	If No, please explain	
	Storage-05.09	exception process	No, Yes
	Storage-05.09.01	If No, please explain	
	Storage-05.10	disposition of non-conforming process	No, Yes
	Storage-05.10.01	If No, please explain	
	Storage-06	Is there a documented program to ensure LLW, which has an identified path for disposal, cannot be stored longer than 1 year, except for storage for decay, or as authorized by the Field Element Manager?	No, Yes
	Storage-06.01	If Yes, please provide the program reference; if No, please explain	
	Storage-07	Is there a documented program/process for inspecting and maintaining container integrity?	No, Yes
	Storage-07.01	If Yes, please provide the program reference; if No, please explain	
	Storage-08	Is there a formal program/process to ensure waste staged for greater than 90 days meets the program requirements for storage?	No, Yes
	Storage-08.01	If Yes, please provide the program reference; if No, please explain	

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	Storage-09	Does the storage facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Storage-09.01	If Yes, please provide the reference; if No, please explain	
	Storage-10	Are there sufficient storage capabilities either onsite/offsite to meet your current and future needs?	No, Yes
	Storage-10.01	If No, please explain	
	Storage-11	Have you or are you planning to close a LLW storage unit?	No, Yes
	Storage-11.01	If yes, under what regulatory authority(ies) is the radioactive portion of the facility closed? (e.g., CERCLA, NEPA, RCRA, Federal Facility Compliance Act (FFCA)	
	Storage-12	Have you or are you planning to close a MLLW storage unit?	No, Yes
	Storage-12.01	Yes, under what regulatory authority(ies) is the radioactive portion of the facility closed? (e.g., CERCLA, NEPA, RCRA, Federal FFCA)	
	Storage-13	Do you have a formal storage lessons learned program at your site?	No, Yes
	Storage-13.01	If Yes, please provide the reference; if No, please explain	
	Storage-14	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex.	
	Storage-15	What issues have you encountered that are currently unresolved.	
	Storage-15.01	Would a revision to 435.1 assist in resolution?	No, Yes

	Storage-15.02	Please explain the proposed revision and provide a justification.	
	Storage-16	What storage issues (include programmatic, contractual or physical) have you resolved?	
	Storage-16.01	Please explain the proposed revision and provide a justification.	
	Storage-17	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	
	Storage-17.01	Please explain the proposed revision and provide a justification.	
	Storage-18	Is there any additional feedback concerning DOE O 435.1 associated with the storage requirements such as staging or monitoring requirements, etc?	
Disposal			
	Disposal-Offsite	If you send LLW offsite for disposal, please answer the following questions:	
	Disposal-Offsite-01	Do you send your waste to	NTS, Commercial facility, Both,
	Disposal-Offsite-02	If NTS disposal, do you	have an active NTS certification, use another DOE Site's NTS certification, use a commercial facility NTS certification,

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	Disposal-Offsite-02.01	If another site, please provide the name of the DOE or commercial site	
	Disposal-Offsite-02.02	What is the reason for using another Site's NTS certification:	cost to obtain the certification, cost to maintain the certification for a small amount of waste, partnering with another Site give economies of scale, other,
	Disposal-Offsite-02.03	If other, please explain	
	Disposal-Offsite-02.04	If using another sites NTS certification, what is the approval method used? (MOU, contract, etc)	
	Disposal-Offsite-03	If commercial disposal, does the facility certify	your waste management program, by waste stream/profile,
	Disposal-Onsite	If you dispose of waste in an onsite facility, please answer the following questions:	
	Disposal-Onsite-01	Provide a list of the facilities(including CERCLA)	
	Disposal-Onsite-02	Does the disposal facility have an approved Disposal Authorization Statement?	No, Yes

	Disposal-Onsite-02.01	If yes, provide the date approved	
	Disposal-Onsite-02.02	If yes, how many revisions have been made?	
	Disposal-Onsite-02.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-02.04	Did the DAS include a conditional approval?	No, Yes
	Disposal-Onsite-02.05	If yes, have the “conditions” been resolved?	No, Yes
	Disposal-Onsite-02.06	If No, are the conditions included in the PA and CA Maintenance Plan?	No, Yes
	Disposal-Onsite-02.07	If No, please explain	
	Disposal-Onsite-03	Does the facility have an approved PA?	No, Yes
	Disposal-Onsite-03.01	If yes, provide the date approved	
	Disposal-Onsite-03.02	If yes, how many revisions have been made?	
	Disposal-Onsite-03.03	If yes, provide the reference; if no, please explain	
	Disposal-Onsite-04	Has the disposal facility prepared and submitted Annual PA and CA Reports	No, Yes
	Disposal-Onsite-04.01	If yes, provide the reference; if no, please explain	
	Disposal-Onsite-05	Does the facility have an approved Composite Analysis (CA)?	No, Yes
	Disposal-Onsite-05.01	If yes, provide the date approved	

	Disposal-Onsite-05.02	If yes, how many revisions have been made?	
	Disposal-Onsite-05.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-06	Does the facility have an approved PA and CA Maintenance Plan?	No, Yes
	Disposal-Onsite-06.01	If yes, provide the date approved	
	Disposal-Onsite-06.02	If yes, how many revisions have been made?	
	Disposal-Onsite-06.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-07	Are the significant PA uncertainties and/or sensitivities, as appropriate, included in the PA and CA Maintenance Plan?	No, Yes
	Disposal-Onsite-07.01	If Yes, please provide the reference; if No, please explain	
	Disposal-Onsite-08	Are the significant CA uncertainties and/or sensitivities, as appropriate, identified in the PA and CA Maintenance Plan?	No, Yes
	Disposal-Onsite-08.01	If No, please explain	
	Disposal-Onsite-09	Does the facility have an approved Closure Plan?	No, Yes
	Disposal-Onsite-09.01	If yes, provide the date approved	
	Disposal-Onsite-09.02	If yes, how many revisions have been made?	
	Disposal-Onsite-09.03	If Yes, please provide the reference; if No please explain	

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	Disposal-Onsite-10	Does the facility have an approved PA Monitoring Plan?	No, Yes
	Disposal-Onsite-10.01	If yes, provide the date approved	
	Disposal-Onsite-10.02	If yes, how many revisions have been made?	
	Disposal-Onsite-10.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-11	Does the facility have an approved CA Monitoring Plan?	No, Yes
	Disposal-Onsite-11.01	If yes, provide the date approved	
	Disposal-Onsite-11.02	If yes, how many revisions have been made?	
	Disposal-Onsite-11.03	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-12	Does the PA Monitoring Plan use inputs from the PA to identify specific radionuclides to be monitored?	No, Yes
	Disposal-Onsite-12.01	If No, please explain	
	Disposal-Onsite-13	Does the CA Monitoring Plan use inputs from the CA to identify specific radionuclides to be monitored?	No, Yes
	Disposal-Onsite-13.01	If No, please explain	
	Disposal-Onsite-14	Has the disposal facility ever exceeded the performance objectives delineated in DOE M435.1-1?	No, Yes
	Disposal-Onsite-14.01	If Yes, please explain	
	Disposal-Onsite-15	Does the disposal facilities WAC include:	

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	Disposal-Onsite-15.01	Allowable activities and/or concentrations of specific radionuclides	No, Yes
	Disposal-Onsite-15.01.01	If No, please explain	
	Disposal-Onsite-15.02	Acceptable waste form and/or container requirements	No, Yes
	Disposal-Onsite-15.02.01	If No, please explain	
	Disposal-Onsite-15.03	Restrictions or prohibitions on waste, materials, or containers	No, Yes
	Disposal-Onsite-15.03.01	If No, please explain	
	Disposal-Onsite-15.04	Void spaces within the waste	No, Yes
	Disposal-Onsite-15.05.01	If No, please explain	
	Disposal-Onsite-15.06	free liquid restrictions	No, Yes
	Disposal-Onsite-15.06.01	If No, please explain	
	Disposal-Onsite-15.07	detonation, explosive, and reaction restrictions	No, Yes
	Disposal-Onsite-15.07.01	If No, please explain	
	Disposal-Onsite-15.08	radiolysis or biodegradation gas generation	No, Yes

	Disposal-Onsite-15.08.01	If No, please explain	
	Disposal-Onsite-15.09	gaseous form limitation	No, Yes
	Disposal-Onsite-15.09.01	If No, please explain	
	Disposal-Onsite-15.10	exception process	No, Yes
	Disposal-Onsite-15.10.01	If No, please explain	
	Disposal-Onsite-15.11	disposition of non-conforming process	No, Yes
	Disposal-Onsite-15.11.01	If No, please explain	
	Disposal-Onsite-16	Does the disposal facility(ies) have a Radioactive Waste Management Basis, approved by DOE, consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment?	No, Yes
	Disposal-Onsite-16.01	If Yes, please provide the reference; if No please explain	
	Disposal-Onsite-17	Does the facility have a program/procedure for identifying, tracking, and resolving problems and/or vulnerabilities associated with the DAS (i.e. Unreviewed Disposal Question, WAC Exemption, etc)?	No, Yes
	Disposal-Onsite-17.01	If Yes, please provide the reference; if No, please explain	
	Disposal-Onsite-18	What are the major issues/vulnerabilities (include programmatic, contractual or physical) concerning PA and CA development/maintenance that you have for your site? (i.e. ensuring consistent modeling approaches)?	

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	Disposal-Onsite-19	What are the major issues/vulnerabilities (include programmatic, contractual or physical) for PA and CA's that should be addressed by Policy or through the Directive system?	
	Disposal-Onsite-20	Are there sufficient disposal capabilities to meet your current and future needs?	No, Yes
	Disposal-Onsite-20.01	If No, please explain	
	Disposal-Onsite-21	Do you have a formal disposal lessons learned program at your site?	No, Yes
	Disposal-Onsite-21.01	If Yes, please provide the reference; if No, please explain	
	Disposal-Onsite-22	Please list any lessons learned or best practices you have experienced at your site that would be beneficial to other sites around the Complex	
	Disposal-Onsite-23	What disposal issues (include programmatic, contractual or physical) have you resolved?	
	Disposal-Onsite-23.01	How did you resolve them?	
	Disposal-Onsite-24	What issues have you encountered that are currently unresolved.	
	Disposal-Onsite-24.01	Would a revision to 435.1 assist in resolution?	No, Yes
	Disposal-Onsite-24.02	Please explain the proposed revision and provide a justification.	
	Disposal-Onsite-25	What issues do you expect to encounter that a revision to DOE M435.1-1 could help avoid and/or manage? Please explain the issue	
	Disposal-Onsite-25.01	Please explain the proposed revision and provide a justification.	

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	Disposal-Onsite-26	Is there any additional feedback concerning DOE O 435.1 associated with the disposal requirements such as what PA documents have to be approved by DOE, etc?	
Crosscutting			
	Crosscutting-01	Does the Site have a Site-Wide Radioactive Waste Management Program approved by the DOE Site Manager?	No, Yes
	Crosscutting-01.01	If Yes, please provide the reference; if No, please explain	
	Crosscutting-02	Does the site send LLW (MLLW) to an offsite commercial facility to be treated, stored, or disposed?	No, Yes
	Crosscutting-02.01	If Yes, has an exemption for use of non-DOE facilities been approved by the DOE Site Manager?	No, Yes
	Crosscutting-02.02	If Yes to #2, has DOE-HQ been notified of the exemption?	No, Yes
	Crosscutting-02.02.01	If Yes, please provide the reference; if No please explain	
	Crosscutting-02.03	If Yes to #2, has the Health Safety and Security Office (HSS) been consulted prior to the disposal facility exemption being executed?	No, Yes
	Crosscutting-02.03.01	If Yes, please provide the reference; if No please explain	
	Crosscutting-03	Does DOE M435.1-1 provide sufficient guidance on treatment, storage, or disposal facilities that cross regulatory lines of authority (i.e. CERCLA/RCRA disposal vs. DOE O 435.1 disposal, in-situ D&D, 40CFR191, etc)?	No, Yes
	Crosscutting-03.01	If no, please provide any recommendations for improvement	
	Crosscutting-04	Do you have waste characterization issues/vulnerabilities when determining if a waste is HLW, LLW, MLLW, or TRU?	No, Yes

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	Crosscutting-04.01	If Yes, please explain	
	Crosscutting-04.02	Should more guidance be provided in this area?	No, Yes
	Crosscutting-04.02.01	If Yes, please explain	
	Crosscutting-05	Do you have re-characterization issues/ vulnerabilities when going from one waste type to another? For example, re-classifying waste from HLW to LLW, or TRU to LLW	No, Yes
	Crosscutting-05.01	If Yes, please explain	
	Crosscutting-05.02	Should more guidance be provided in this area?	No, Yes
	Crosscutting-05.02.01	If Yes, please explain	
	Crosscutting-06	Has the LLW Corporate Board been effective in identifying and resolving issues at your site as well as crosscutting issues across the Complex?	No, Yes, Unknown,
	Crosscutting-06.01	What recommendations do you have to improve the effectiveness of the LLWCB?	
	Crosscutting-07	Has the LLW Disposal Facility Federal Review Group (LFRG) been effective in identifying and resolving issues at your site as well as crosscutting issues across the Complex concerning PA and CA issues?	No, Yes, Unknown,
	Crosscutting-07.01	What recommendations do you have to improve the effectiveness of the LFRG?	
	Crosscutting-08	What recommendations do you have to improve the Waste Information Management System (WIMS)?	
	Crosscutting-09	Does your Site have a formal Waste Minimization and Pollution Prevention program?	No, Yes
	Crosscutting-09.01	If Yes, please provide the reference; if No, please explain	

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	Crosscutting-10	Does DOE M435.1-1 provide sufficient guidance on how “upsets” are handled at the TSD facility when they cross waste types (HLW, TRU, MLLW) or regulatory authorities (CERCLA, RCRA, TSCA)?	No, Yes
	Crosscutting-10.01	Please provide any recommendations for improvement	
	Crosscutting-11	Are there any issues that have not been covered in the above responses that you would like to see clarified or improved in the revision to DOE O 435.1 and its associated Manual and Guide?	
	Crosscutting-12	Are there any issues concerning the packaging and transportation of radioactive material you would like to see clarified in DOE O 435.1 or in another DOE Directive?	
Field Element			
	Field Element-01	Has the DOE FEM ensured the following responsibilities (delineated in Chapter I of DOE M 435.1-1) are implemented?	
	Field Element-01.01	Developing, documenting, implementing, and maintaining a Site-Wide Radioactive Waste Management Program.	No, Yes
	Field Element-01.01.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.02	Ensuring a radioactive waste management basis is developed and maintained for each DOE radioactive waste management facility, operation and activity and ensuring review and approval of the basis before operations begin.	No, Yes
	Field Element-01.02.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.03	Ensuring implementation of waste minimization and pollution prevention programs	No, Yes

	Field Element-01.03.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.04	Approval of exemptions for use of non-DOE facilities.	No, Yes
	Field Element-01.04.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.05	Ensuring the management and disposal of radioactive waste resulting from environmental restoration activities, including decommissioning, meet the substantive requirements of DOE M 435.1-1.	No, Yes
	Field Element-01.05.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.06	Ensuring development, review, approval and implementation of the radioactive waste acceptance requirements for facilities that receive waste for storage, treatment, or disposal.	No, Yes
	Field Element-01.06.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.07	Ensuring development, review, approval, and implementation of a program for waste generation planning, characterization, certification, and transfer.	No, Yes
	Field Element-01.07.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.08	Ensuring development, review, approval and implementation of closure plans for radioactive waste management facilities in accordance with the applicable requirements in the waste type chapters of DOE M435.1-1.	No, Yes
	Field Element-01.08.01	If yes, provide the reference. If no, please explain.	

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	Field Element-01.09	Ensuring defense-in-depth principles are incorporated where potential uncertainties or vulnerabilities warrant their use when reviewing and approving radioactive waste management activities and documents.	No, Yes
	Field Element-01.09.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.10	Ensuring oversight of radioactive waste management facilities, operations, and activities is conducted.	No, Yes
	Field Element-01.10.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.11	Ensuring a training and qualification program is implemented for designated radioactive waste management program personnel, and the training is commensurate with job duties and responsibilities.	No, Yes
	Field Element-01.11.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.12	Ensuring ALARA principles for radiation protection are incorporated when reviewing and approving radioactive waste management activities.	No, Yes
	Field Element-01.12.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.13	Ensuring all radioactive waste is stored in a manner that protects the public, workers, and the environment in accordance with a radioactive waste management basis and that the integrity of waste storage is maintained for the expected time of storage and does not compromise meeting the disposal performance objectives for protection of the public and environment when the waste is disposed.	No, Yes
	Field Element-01.13.01	If yes, provide the reference. If no, please explain.	

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	Field Element-01.14	Ensuring all radioactive waste requiring treatment is treated in a manner that protects the public, workers, and the environment and in accordance with a radioactive waste management basis.	No, Yes
	Field Element-01.14.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.15	Ensuring all radioactive waste is disposed in a manner that protects the public, workers, and the environment and in accordance with a radioactive waste management basis.	No, Yes
	Field Element-01.15.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.16	Ensuring monitoring is conducted for all radioactive waste management facilities as required.	No, Yes
	Field Element-01.16.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.17	Ensuring, to the extent practical, radioactive material and waste generated under a program that is classified for national security reasons is declassified or rendered suitable for unclassified radioactive waste management.	No, Yes
	Field Element-01.17.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.18	Ensuring that waste incidental to reprocessing determinations are made by either the “citation” or “evaluation” process.	No, Yes
	Field Element-01.18.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.19	Ensuring a process is developed and implemented for identifying the generation of radioactive waste with no identified path to disposal and reviewing and approving conditions under which radioactive waste with no identified path to disposal may be generated.	No, Yes

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	Field Element-01.19.01	If yes, provide the reference. If no, please explain.	
	Field Element-01.20	Ensuring a process exists for proposing, reviewing, approving, and implementing corrective actions when necessary to ensure that the requirements of DOE M435.1-1 are met and to address conditions that are not protective of the public, workers, or the environment.	No, Yes
	Field Element-01.20.01	If yes, provide the reference. If no, please explain.	
	Field Element-02	If the FEM has delegated his/her responsibilities to a direct report or to a contractor, is the delegation formally documented?	No, Yes
	Field Element-02.01	If yes, provide the reference. If no, please explain.	
	Field Element-03	How does the FEM implement the oversight requirements of Chapter I,2.F (10) of DOE M435.1-1?	
	Field Element-03.01	Please explain and provide a reference.	
	Field Element-04	Briefly describe the contracting arrangement at your site as it relates to the generation, treatment, storage, disposal of LLW. (i.e., there are two primary contracts at the SRS. M&O contractor is responsible for the overall waste management program at the site. The Liquid Waste Contractor is a generator of LLW and complies with the overall waste management program established by SRNS.	
	Field Element-04.01	Are there issues associated with or opportunities to improve the contract arrangement with respect to radioactive waste management activities?	No, Yes
	Field Element-04.02	If Yes, please explain	

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	Field Element-05	Briefly describe the arrangement at your site as it relates to the generation, treatment, storage, and disposal of LLW where various Program Offices are involved. (i.e., several Program Offices (EM, NNSA, SC, NE) are located at the Oak Ridge Reservation. Each of these Program Offices is responsible for the TSD of LLW.	
	Field Element-05.01	Are there issues associated with or opportunities to improve the Program Office arrangement with respect to radioactive waste management activities?	No, Yes
	Field Element-05.02	If Yes, please explain	
	Field Element-06	Explain if DOE M435.1-1 provides sufficient information for the generation and disposal of radioactive classified matter.	
	Field Element-07	How do you ensure that waste generated under a classified program is declassified or rendered suitable for unclassified radioactive waste management?	

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Appendix C. Complex-wide Review Team Members

From the very start of planning for the complex-wide review of radioactive waste management, it was decided to include a full representation of the experience from across the complex, both DOE federal leadership and contractor subject matter expertise. Marty Letourneau, as the EM-41 Project lead, assembled a coordinating team of Howard Pope, Erick Reynolds and Kevin Kytola to organize the scope, schedule, budget, and resources required to execute the review. The resources were recruited complex-wide and organized into teams to define the lines of inquiry, facilitate the reviews, analyze the data, and draft the report. The following is the list of contributors to this radioactive waste management complex-wide review as members of the coordinating project team or as members of the subject matter core teams:

Project Coordinating Team

Martin Letourneau, project lead	DOE EM-41
Howard Pope, project coordinator	Project Enhancement Corp.
Erick Reynolds, technical coordinator	Project Enhancement Corp.
Kevin Kytola, planning lead	Sapere Consulting

Headquarters – General Requirements Review – HQ Core Team

Mary Willcox, lead	DOE ID EM
Dennis Knapp	Savannah River Nuclear Solutions
Eric Pierce	DOE EM-30
Edward Regnier	DOE HS-43

Sites – High Level Waste Requirements Review – HLW Core Team

Joel Case, lead	DOE ID EM
Sonny Goldston	Savannah River Nuclear Solutions
Bill Hewitt	YAHSGS, LLC
Tony Kluk	DOE EM-43
Linda Suttora	DOE EM-41
Steve Thomas	Savannah River Remediation

Sites – Transuranic Waste Requirements Review – TRU Core Team

Alton Harris, co-lead	DOE EM-43
J.R. Stroble, co-lead	DOE CB EM
Tim Burns	LANL
Mark Doherty	
Sean Dunagan	Sandia
Court Fesmire	DOE CB EM
Lee Fox	Savannah River Nuclear Solutions
Jerry O'Leary	SRS
Kerry Watson	DOE CB EM

Sites – Low Level and Mixed Low Level Waste Requirements Review – LLW Core Team

Frank DiSanza, lead	DOE NTS EM
Ginger Humphries	Savannah River Nuclear Solutions
Greg Geisinger	National Security Technologies, LLC (NSTec)
Susan Krenzien	Navarro-Intera
John Patterson	Strata-G
Roger Seitz	Savannah River National Laboratory
Danny Smith	Strata-G
Douglas Tonkay	DOE EM-43
Elmer Wilhite	Savannah River National Laboratory

Project Senior Technical Advisor Team

Willis Bixby	WWBX, LLC
Mark Frei	Longenecker & Assoc
John Greeves	JTG Consulting
Keith Klein	Longenecker & Assoc
James Lieberman	JTG Consulting
John Longenecker	Longenecker & Assoc

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2010 Report summerizing the results of a 2009 complex wide review and survey of DOE's Radioactive Waset Management after 10 years of implementing DOE order 435.1.

Survey Report by & for:
Office of Environmental Compliance
Office of Technical & Regulatory Support
Office of Environmental Management

U.S. DEPARTMENT OF ENERGY