Department of Energy
Washington, DC 20585

January 3, 2005

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, DC 20004

Dear Mr. Chairman:

Commitment 4.5 of the Department of Energy's (DOE) Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls,* calls for a report to the Secretary of Energy on the results of site reviews to confirm specific administrative controls are properly treated in safety basis documents and implementing procedures. Enclosed is the report from the Office of Environmental Management.

If you have any questions, please contact me at (202) 586-7709 or Mr. Dae Chung, Director, Office of Licensing, at (301) 903-3968.

Sincerely,

Inés Triay

Dr. Inés Triay
Deputy Chief Operating Officer
Office of Environmental Management

Enclosure

cc: M. Whitaker, DR-1

Office of Environmental Management
Assessment of
Specific Administrative Controls

Final Report

December 2004

EXECUTIVE SUMMARY

The Department of Energy (DOE) Implementation Plan (IP) for Defense Nuclear Facilities Safety Board's (DNFSB) Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls* committed the Office of Environmental Management (EM) to review field implementation of critical administrative controls and verify that they are developed, implemented, and maintained as part of safety basis implementation and operational oversight. In accordance with Commitment 4.5, a final report was to be submitted to the Secretary of Energy summarizing the results of the reviews.

This report describes review activities conducted over a period of approximately 14 months, beginning in July 2003. The assessments were intended, in part, to evaluate, whether EM operations were in line with DOE expectations described in the proposed DOE Standard (STD), SAFT-0091, *Specific Administrative Controls,* which was later published as DOE STD-1186-2004 in August 2004. This standard was prepared in accordance with another commitment related to Recommendation 2002-3.

Hazard category 2 and 3 facilities from around the DOE-EM complex were evaluated. Assessments involved a review of contractor prepared documented safety analyses (DSA) and Technical Safety Requirements (TSR), as well as safety evaluation reports prepared by DOE to approve the facility safety basis. Contractor and DOE site personnel were interviewed, and facility tours were also conducted.

The vast majority of EM facilities were found to have either explicit administrative control statements or specific administrative controls as part of the control suite used to protect against accidents with "significant consequences." There was no identified case where major omissions of specific administrative controls led to an imminent safety concern. However, there were numerous opportunities identified to improve the clarity and derivational information supporting specific administrative controls and the clarity of controls with the TSRs).

Corrective actions are currently ongoing based on specific recommendations provided at each site. Future assessment actions are planned at Hanford and Savannah River, which require further review since they preceded the DOE draft STD, SAFT-0091. Facilities managed by the Portsmouth/Paducah Project Office will be also reviewed by February 2005. A self-assessment process will be used to evaluate progress at these three sites.

EM will build off progress and insights gained from site-specific assessments. Further actions are planned to improve the formulation and derivation of specific administrative controls at EM nuclear facilities. EM will also continue to work with the Office of Environment, Safety and Health on the best strategy for incorporating DOE-STD-1186 into the directives framework supporting 10 Code of Federal Regulations (CFR) 830, Subpart B (i.e., safe harbor standards, DOE G 421.1-2, DOE O 420.1B).

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List of Acronyms

AC	Administrative Control
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DSA	Documented Safety Analysis
EM	Office of Environmental Management
INEEL	Idaho National Engineering and Environmental Laboratory
LLNL	Lawrence Livermore National Laboratory
NTS	Nevada Test Site
ORR	Oak Ridge Reservation
ORP	Office of River Protection
RL	Richland Office
SAC	Specific Administrative Control
SER	Safety Evaluation Report
SME	Subject Matter Expert
SMP	Safety Management Program
SSC	Structure, System, and Component
SRS	Savannah River Site
STD	Standard
TRU	Transuranic
TSR	Technical Safety Requirements
WIPP	Waste Isolation Pilot Project

1.0 INTRODUCTION

The Department of Energy (DOE) Implementation Plan for Defense Nuclear Facilities Safety Board's Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls* committed the Office of Environmental Management (EM) to review field implementation of critical administrative controls and verify that they are developed, implemented, and maintained as part of safety basis implementation and operational oversight. Subsequently, EM submitted a plan and schedule to DNFSB that entailed informal assessments of major EM sites and facilities. The assessments were intended to evaluate, in part, whether EM operations were in line with DOE expectations described in the proposed DOE standard, SAFT-0091, *Specific Administrative Controls,* which was later published as DOE STD-1186-2004 in August 2004.

This report provides the results of an assessment conducted at major EM facilities over a period of approximately 14 months, beginning in July 2003. Sites visited include the Savannah River Site (SRS); Hanford Site, Richland Office (RL) and Office of River Protection (ORP); Oak Ridge Reservation (ORR); Nevada Test Site (NTS); Lawrence Livermore National Laboratory (LLNL); Idaho National Engineering and Environment Laboratory (INEEL); and the Waste Isolation Pilot Project (WIPP). The individual results of EM assessments were provided to each site as an out-briefing or interim field report. The scope of the assessment, as well as the approach used, the final results and overall conclusions are presented in the following sections.

2.0 SCOPE OF ASSESSMENT

The primary purpose of the assessment was to evaluate the adequacy of the safety control strategy applied to hazard category 2 and 3 facilities/activities. The assessment placed a particular emphasis on how specific administrative controls (SACs) were identified and derived. In particular, this included the following considerations:

(1) Were SACs selected in lieu of engineered features?

(2) Were SACs appropriately derived within documented safety analyses (DSAs)?

(3) Were SACs appropriately flowed into Technical Safety Requirements (TSRs), and

(4) Did sufficient mechanisms exist to support implementation and maintenance of SACs [NOTE: actual adequacy implementation actions will be assessed through future actions].

Performance was considered both in terms of the contractor and DOE operations/site offices. While the focus of the assessment was on SACs, the supporting analytical basis for their establishment was also reviewed as a part of this assessment.

3.0 TEAM COMPOSITION

The review team included a cross-section of Federal and contractor support personnel with backgrounds and experience in nuclear safety analysis and environmental cleanup operations. Mr. Dae Chung, Director, Office of Licensing (EM-24) led the team. A listing of other team members is shown below.

Team Members

Robert Nelson, Office of River Protection
Jay Mullis, Oak Ridge Operations
Angela Colarusso, Nevada Operations
Patrice McEahern, CALIBRE Systems
Joong M. Yang, Lawrence Livermore National Laboratory
Jeff Woody, Atlas Consulting LLC

4.0 ASSESSMENT APPROACH

The assessment effort was conducted by the Department of Energy's Office of Licensing (EM-24), which is an organization within the Office of Environmental Management. The assessment consisted of a review facility Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs) associated with selected facilities in conjunction with an onsite review. Reviews were conducted over approximately fourteen months, beginning July 2003 through September 2004.

The facilities evaluated are shown in Table 1 and represent a cross-section of EM operations throughout the complex. All major sites are represented, with the exception of Portsmouth and Paducah sites. Responsibility for these sites was recently transferred from Oak Ridge Operations Office to Portsmouth/Paducah Project Office (PPPO). Contractor control selection processes and previous DOE approval of most safety basis documents at Portsmouth/Paducah is very similar to that evaluated at Oak Ridge. However, given that PPPO is now independent, a self-assessment will be initiated in January 2005 for facilities managed by PPPO.

The onsite review included discussions with DOE and contractor managers and technical staff, a review of contractor processes and procedures, and a review of EM facilities constituting a representative sample at each major EM site. Contractor organizations included safety and operations personnel, as well as facility managers. DOE safety basis reviewers, safety operations managers, facility representatives and subject matter experts such as fire protection were also interviewed. The team devoted approximately 1/2 day for each facility being reviewed. Team members were familiar with facilities through previous site visits and tours.

At each site the responsible contractor presented their overall safety basis process and methods applied to select the controls for each DSA. This presentation highlighted the results of hazard and accident analyses, and the controls selected for each facility reviewed. The technical basis for control selection/identification (passive/active, engineered/administrative) was of particular interest to the team. Also, for any SAC identified, the identification, and documentation flow through the DSA (Chapter 3, 4, 5) to the TSR was presented. The team looked for evidence of implementing mechanisms (e.g., implementation matrix, implementation validation review), as well as the DOE review, approval and oversight process.

The Assessment Team's approach was, first and foremost, to complete reviews of each DSA, supporting documentation and procedures. Additionally, specific scenarios in the accident analysis were selected for in-depth review and verification that the site applied the methodologies as presented. The team also evaluated the selection of controls and application of criteria used to identify safety significant or safety-class controls. Secondarily, the team conducted a review of implementation mechanisms for Technical Safety Requirement (TSR) controls. Lastly, the Team reviewed Safety Management Programs, including the work control process.

Specific review criteria were developed to support the assessment that considered important aspects of safety control selection and implementation. A major influence was EM guidance on hazard control selection (see reference 1), which was transmitted to EM field sites in May 2003. This guidance was based on good practices collected from EM field sites and has a strong emphasis on SACs. Assessment criteria also gave strong consideration to DOE Nuclear Safety Technical Position 2003-1, *Use of Administrative Controls for Specific Safety Functions*, and draft DOE Technical Standard, *Specific Administrative Controls* (SAFT-0091), which was later published as DOE-STD-1186-2004.

Appendix A of this report provides the assessment criteria used by the team in reviewing contractor processes, specific facilities, and DOE safety basis review activities. Criteria were originally developed to support the initial assessments at SRS and Hanford. This occurred prior to issuance of SAFT-00091. Subsequent to the SRS and Hanford assessments, criteria were updated based on a draft version of the standard. The assessment criteria capture the primary expectations presented in the standard, as well as additional elements of interest to EM.

The EM team consolidated issues and recommendations identified during the assessment and provided the results and conclusions to contractor and DOE personnel at assessment out-briefings. Interim field reports were prepared and transmitted to several individual sites.

Table 1. EM Facilities Reviewed

Facility	Hazard Category	Type of Operation	Responsible Contractor	Basis for Selection
[redacted]				
Melton Valley TRU Waste Retrieval Project	2	TRU Waste Retrieval	Bechtel Jacobs Company	Melton Valley TRU Waste Retrieval Project is an environmental restoration project that involves retrieval of TRU wastes under a temporary weather enclosure. A permanent facility confinement is not available.
Melton Valley Solid Waste Storage Facilities	2	TRU Waste Storage	Bechtel Jacobs Company	The Melton Valley Solid Waste Storage Facilities (MVSWSF) involves handling, staging and storage of TRU wastes Many waste containers are old, unvented and degraded.
Molten Salt Reactor Experiment	2	Decommissioning	Bechtel Jacobs Company	The Molten Salt Reactor Experiment (MSRE) facility is a decommissioning of a hazard category 2, research reactor.
Liquid Low Level Waste	2	Liquid Waste Collection and Storage	Bechtel Jacobs Company	The Liquid Low Level Waste (LLLW) Facility is an operating waste management facility.
TRU/Alpha Waste Handling Facility	3	Liquid Waste Processing	Foster Wheeler Environmental Corporation	The TRU Alpha/Low Level Waste Facility is a newly operated treatment and storage facility that is managed by Foster Wheeler Environmental Corporation under direct contract to DOE. It represents the final stage for treatment and packaging of low level and TRU waste at ORNL.
[redacted]				
KAMS	2	Canister Storage	Washington Group Savannah River Corp	The K-Area Material Storage facility stores Pu in DOE-STD-3013 containers enclosed in DOT compliant transportation containers.
DWPF	2	Waste Storage	Washington Group Savannah River Corp	The Defense Waste Processing Facility is a hazard category 2 glass processing and storage facility. The facility manages both liquid and solid wastes.

Table 1. EM Facilities Reviewed

Facility	Hazard Category	Type of Operation	Responsible Contractor	Basis for Selection
SRTC	2	Laboratory	Washington Group Savannah River Corp.	The Savannah River Technology Center is a laboratory that supports waste characterization, and radiological operations.
H-Canyon	2	Decommissioning	Washington Group Savannah River Corp	Decommissioning of a large, contaminated hazard category 2-canyon facility.
HB-Line	2	Decommissioning	Washington Group Savannah River Corp	The HB-Line facility is a hazard category 2 facility with gloveboxes and processing equipment similar to other decommissioning facilities within the complex.
235-F	2	Canister Storage	Washington Group Savannah River Corp	The 235-F building planned use includes increased storage capacity, Pu stabilization, and limited sampling activities. This is an existing facility that is being converted to an alternate use.
[redacted]				
PFP	2	Pu Stabilization and Deactivation	Fluor Hanford	The Plutonium Finishing Plant is a facility that is slated for decommissioning, however is currently processing material (stabilizing and packaging).
Solid Waste Complex	2	Waste Storage	Fluor Hanford	The Solid Waste Complex represents multiple facilities that retrieve and store TRU waste.
232-Z	3	Decommissioning	Fluor Hanford	The 232-Z facility represents one of the first applications of the use of DOE STD-1120 under 10 CFR 830.
[redacted]				
Tank Farms	2 and 3	Waste Storage	CH2M Hill Hanford Group	The tank farm is a collection of waste storage tanks that are undergoing stabilization and terminal clean out. Individual tanks are classified as hazard category 2 and 3.

Table 1. EM Facilities Reviewed

Facility	Hazard Category	Type of Operation	Responsible Contractor	Basis for Selection
242-A Evaporator	2	Waste Processing	CH2M Hill Hanford Group	The 242-A is an operating evaporator facility.
222-S	3	Laboratory	CH2M Hill Hanford Group	The 222-S facility is a laboratory facility that supports waste characterization and radiological operations.
[redacted]				
Power Burst Facility	2	Decommissioning	Bechtel BWXT Idaho	The PBF is a research reactor that is in the decommissioning process
INTEC-CCP-603 Basin	2	Decommissioning	Bechtel BWXT Idaho	Closure of spent fuel storage pool
RWMC GEM Project	2	TRU Waste Retrieval	Bechtel BWXT Idaho	Cleanup operations involving retrieval of buried transuranic and low level waste from the Subsurface Disposal Area
Advanced Mixed Waste Treatment Project	2	TRU Waste Retrieval, Characterization and Packaging	Bechtel BWXT Idaho	Cleanup operations involving retrieval of buried transuranic waste from the Transuranic Storage Area
[redacted]				
Area 5	2	Waste Characterization and Storage	Bechtel Nevada	Area 5 is a waste storage area that uses WIPP mobile characterization units to characterize waste and prepare for shipment to WIPP.
[redacted]				
DWTF	2	Waste packaging and staging.	Lawrence Livermore National Laboratory	The Defense Waste Treatment Facility includes capabilities for characterization, size reduction and repackaging TRU waste.
Area 612	2	Waste Storage	Lawrence Livermore National Laboratory	Area 612 is a yard storage area.

Table 1. EM Facilities Reviewed

Facility	Hazard Category	Type of Operation	Responsible Contractor	Basis for Selection
TRU Waste Characterization	3	Waste Characterization	Lawrence Livermore National Laboratory	TRU Waste Characterization deploys WIPP mobile characterization units to meet WIPP shipping criteria. Authorized activities include characterization, inspection and repackaging.
B695	3	Liquid Waste Processing	Lawrence Livermore National Laboratory	The B695 Segment of the Defense Waste Treatment Facility is responsible for liquid waste processing (B695) and some solid waste processing in B696S.
B696S	3	Solid Waste Processing	Lawrence Livermore National Laboratory	The B695 Segment of the Defense Waste Treatment Facility is responsible for liquid waste processing (B695) and some solid waste processing in B696S.
[redacted]				
Underground and Above- ground Facilities	2	Waste Storage	Washington TRU Solutions	Disposal facility for TRU waste

6.0 ASSESSMENT RESULTS

EM operations include waste management, facility decommissioning, environmental restoration and surveillance and maintenance. The EM Assessment Team selected a cross-section of these operations that ranked as Hazard Category 2 or 3 in accordance with DOE-STD-1027-2002. Other selection criteria included mission importance and relative worker risk. Rationale for selection of facilities is listed in Table 1.

6.1 General Observations

Site-specific assessments provided valuable insights into the current status of DSAs regarding formulation and derivation of SACs. In general, sites had an overall awareness of the importance of SACs and the expectations related to SAFT-0091. Because the standard was finalized in August 2004, toward the end of the EH assessment effort, EM field sites were not expected to be in compliance with all aspects of DOE-STD-1186-2004. However, most sites did explicitly identify SACs apart from safety management programs (SMPs). In some cases, the quality of AC descriptions and derivation basis was in need of improvement.

The vast majority of facilities identified either explicit administrative control statements or specific administrative controls as part of the control suite to protect against accidents with "significant consequences." With the exception of a few facilities, explicit administrative controls and specific administrative controls were linked to the hazard and accident analysis, highlighted within TSR derivation chapter of the DSA and flowed forward to the TSR. In those cases where the assessment team identified concerns over the absence of specific administrative controls or the supporting analytical basis, the particular site responded with corrective actions.

There was no identified case where major omissions of specific administrative controls led to an imminent safety concern. However, there were numerous opportunities identified to improve the clarity and derivational information supporting specific administrative controls and the clarity of controls with TSRs. This also extends to the DOE safety basis review process, which could benefit from specific review criteria related to DOE-STD-1186.

6.2 Summary of Assessment Findings at EM Sites

Safety Basis Preparation and Control Selection Process

Contractor procedures exist at each site for safety basis development that includes guidance for hazard control selection. No site had explicitly incorporated DOE's expectations for SACs into local command media. This is primarily because of the timeframe in which DOE-STD-1186 was issued (August 2004) relative to the timing of site assessments. No contractor had incorporated DOE-STD-1186 into contract provisions. However, each site has adopted principles that align with DOE-STD-3009 regarding a proper hazard control hierarchy, and this includes identification of administrative controls, as necessary within DSAs and protection within TSRs.

Based on the review criteria consistently applied at the each site, the assessment team was able to compare and contrast each site's process for selecting hazard controls. Each site has established ranking or binning schemes that are applied to accident events as a tool to assist in selecting hazard controls based on accident frequencies and the magnitude of consequences to various receptors. The assessment team found a substantial range in numerical criteria that are used as an input to determining "safety significant" or even "safety class" controls. For example, some sites judged a worker exposure in the range of 5 rem to warrant safety significant controls, while others used 100 rem as this threshold. Additionally, some sites applied a "safety-class" pedigree when offsite exposures exceeded 1 rem, while some facilities were without safety-class controls in spite of consequences an order of magnitude higher.

This situation causes an inconsistency in how controls are selected in the EM complex and could lead to an absence of safety SSCs or specific administrative controls at a site. Some evidence of this was identified for TRU waste operations that occur at multiple EM sites. Certain facilities established SACs that restrict drum handling and storage activities while others found these controls weren't warranted as specific administrative controls, managing the hazard as a standard industrial hazard under its commitment to OSHA requirements. Examples include staging limits, requirements for lid restraints on bulging drums for deflagration concerns, and prohibitions on fuel-powered forklifts. During the course of site assessments, the assessment team encouraged sites to standardize control selection. EM headquarters prepared guidelines based on common approaches noted at Hanford, Oak Ridge and LLNL. These guidelines have since been proposed for incorporation into DOE-STD-1120, which is currently being updated by the Office of Environment, Safety and Health.

Hazard/Accident Analysis

Another common contributor that impacted the quality of the control selection process was related to hazard and accident analysis assumptions. All EM sites conducted a systematic analysis to support control selection that was previously reviewed as part of the site-specific safety basis review and approval process. While the assessment team did not replicate this review process, general hazard analysis assumptions affecting control selection were evaluated at each facility reviewed.

Hazard and accident analysis assumptions were inconsistent across the complex. This issue was most profound for TRU waste operations, which are similarly conducted at several sites. In particular, fire modeling assumptions such as fire durations and magnitude, drum response, and airborne release fractions were inconsistent. In the case of airborne release fractions, there was some variability in how sites applied DOE-HDBK-3010 to drum fire events. This can have a significant impact on the magnitude of consequences and could affect control selection decisions. Modeling differences in the analysis of postulated TRU waste drum deflagrations and postulated vehicle collision ensued by a large pool fire were also noted.

EM has established a corrective action that requires standardization of analytical and derivational bases that support common SACs important to TRU waste operations. This action will be accomplished by EM headquarters in coordination with DNFSB, NNSA, DOE field sites, EH and the contractor community. Guidance is planned for issuance in FY 2005.

Selection and Derivation of SACs

As a common practice that is consistent with DOE-STD-3009, EM facility DSAs provide a linkage of hazard controls with the results of the hazard and accident analysis. The team verified this fact, although in some cases inconsistencies were identified between TSR controls and those identified in the DSA. In general, candidate preventive and mitigative features are described in hazard analysis tables, and those credited as TSR controls are highlighted and identified as part of TSR derivation.

The most prevalent type of SAC identified at EM facilities relate to various limits that are necessary to protect key assumptions of the hazard and accident analysis. This includes limits on facility or container inventory, as well as explicit limits related to hotwork or combustible loading. Examples include prohibitions on gas or diesel powered equipment, limits on combustibles, or separation distances between fuel piles or ignition sources. Violation of this type of SAC could have a direct effect on the potential consequences to the public and the workers, (e.g., the radionuclide inventory limit in a container or in a building). For example, an inventory limit of 50 PE Ci for TRU waste drums is established as the SAC in the Waste Storage Facilities at LLNL. An increase above and beyond the stated TSR limit could lead to an increase in potential consequences that is higher than the value approved by DOE in the Safety Evaluation Report (SER).

No instance was identified from the assessment effort in which administrative controls were selected in lieu of engineered safety features. However, several cases were noted where specific administrative controls were established as a supplement to safety SSCs that were unreliable, unavailable or not completely effective on their own. For example, a specific administrative control was identified in the Liquid Low Level Waste facility in Oak Ridge that prohibited hoisting and rigging operations in the vicinity of certain pump and valve vaults. This was necessary because structural integrity of the vaults could not be verified to withstand a heavy dropped load.

Overall, DSAs provided adequate derivation of TSR controls for safety SSCs. Derivation information for administrative controls varied, and was generally more extensive when presented as a SAC rather than an explicit element of a safety management program. Where presented, derivational information was judged to be sufficient in light of the simplicity of specific administrative controls established (i.e., either related to limits or simple actions).

TSR Controls

Most TSRs do not identify SACs in strict accordance with DOE-STD-1186. In these cases, the intent of the standard is addressed through the use of "explicit" AC statements that are key elements of a safety management program. However, it is not always clear that a single non-compliance with the AC statement would be treated as a violation. The vague definition of TSR violations was identified as an issue at several sites.

Typical specific administrative controls identified at many EM sites consist of simple actions or limits that protect hazard analysis assumptions and boundaries of the safety analysis (i.e., combustible control limits and inventory thresholds). Methods of establishing reliability, such as redundancy, diversity and separation were not observed either as a rule of SAC construction described in the DSAs reviewed, or in application. The use of defense in depth (i.e., ACs are part of larger control suite) or inspection are more commonly used to increase confidence that an SAC will be capable of performing its credited function.

Rationale for selection and use (e.g., safety function, or performance criteria) that is comparable to the basis of a Limiting Condition for Operation (LCO) was provided at most sites either as a brief basis statement in the TSR, or in the TSR derivation chapter, typically chapter 5 of the DSA. None of the SACs reviewed were in LCO format, although some SACs did provide actions and time frames that may be comparable to LCO controls. The level of detail provided to support the basis for application of the SACs varies between sites. The basis typically provides several sentences to several paragraphs that describe the SAC, the basis for selection and supporting information, such as applicable codes, and performance expectations.

TSR Implementation Mechanisms

Many of the credited SACs specify requirements for inspection or independent verification of implementation. At a minimum, sites ensure that a control is verified upon implementation and on a routine basis through the assessment program. Some SACs did specify a surveillance and a frequency of performance. However, not all ACs satisfy this requirement explicitly.

DOE review and Approval Process

The Assessment Team reviewed Safety Evaluation Reports (SERs) and interviewed DOE safety basis reviewers to determine how much consideration was given to SACs. While explicit criteria on SACs was generally not found in SERs, the approval bases typically evaluated the control hierarchy and whether linkage was provided to the hazard analysis, controls were derived within the DSA, and established within TSRs. This included consideration of SACs or explicit ACs.

As an example, the SER for the Liquid Low Level Waste Facility in Oak Ridge identified a condition of approval that required the contractor to provide additional derivation of an explicit AC related to waste acceptance criteria. A subsequent SER addendum was prepared that gave the DOE approval basis for an explicit AC that prohibited hoisting and rigging operations near pump and valve vaults that had deficiencies in structural integrity.

While the assessment team did not perform a detailed assessment of safety basis reviewer qualifications, most were knowledgeable of relevant facility operations and controls. Additionally, all of the reviewers were familiar with the NTSP 2003-1 and had reviewed the draft version of DOE-STD-1186.

6.3 Specific Administrative Control Related Issues and Corrective Action Status

The assessment team generated site-specific recommendations intended to improve clarity of analytical assumptions or hazard control selection processes, as well as those directly related to identification or derivation of specific administrative controls. Sites have responded with corrective actions to address all types of issues, and EM continues to monitor progress and ensure closure of assessment findings.

This section describes assessment team recommendations that are germane to DOE expectations for specific administrative controls found in DOE-STD-1186. Table 2 provides a breakdown of recommendations provided at each site and the status of corrective actions. Written recommendations were provided to each site, with the exception of Hanford and SRS. Assessment observations were conveyed during out-briefings at those two sites.

Corrective actions are ongoing at all sites. In some cases, responses to EM findings have not been accepted, and corrective actions are not finalized pending further discussion. These actions are highlighted in Table 2 with an asterisk. EM-1 recently issued a memorandum that requires closure of all assessment findings.

Table 2. Specific Administrative Control Issues and Status of Corrective Actions

Site	Assessment Team Recommendation	Related DOE-STD-1186 Expectation	Status
INEEL	The AMWTP DSA and TSR should be updated to address the soil removal restriction in the TSA-RE. This relates to the incremental removal of soil on cells being actively retrieved and restrictions that cells not actively being retrieved remain covered with at least 2 inches of soil.	A SAC may be needed to protect the validity of a hazard or accident analysis assumption	*The issue was evaluated through a USQ determination, and no change to the DSA was proposed. NE-ID has committed to increased oversight of fire safety issues at AMWTP.
	BFNL and BBWI should clarify within TSRs that violations can result from a direct failure to follow a SAC.	A violation of a SAC is an immediate TSR violation	*BFNL and BBWI have agreed to treat any SAC violation as TSR violation.
NTS	Bechtel Nevada needs to update Chapter 5 of the DSA with derivational bases for all SACs that flow from Chapter 3 and that are covered in the TSR. These bases should indicate why the control is selected (i.e., which accident(s) are being prevented or mitigated by the control), whether the control is selected in lieu of or supplement to safety SSCs, and why the control is considered effective.	The DSA should provide information to support the derivation of hazard controls described in the TSR document.	The DSA/TSR will be updated to address this issue in the next annual update.
	Bechtel Nevada needs to update the TSR with regard to what the team believes are SACs currently listed as programmatic controls within the "Fire Protection Program" and "Waste Handling and Storage Program."	Controls identified as part of a safety management program may need to have enhanced dependability as in the case with SACs	The DSA/TSR will be updated to address this issue in the next annual update.
WIPP	WTS should update the DSA to be consistent with derivational guidelines provided in DOE-STD-1186. This includes explicit description of SACs and associated derivational information	The DSA should provide information to support the derivation of hazard controls described in the TSR document.	A DSA/TSR update is planned for March 2005.

	WTS should update the TSRs to address consistency with DOE-STD-1186 (i.e., SACs are not explicitly described in the TSR, and TSR violation definition is not clearly presented).	The TSR should explicitly present SACs. A violation of a SAC is an immediate TSR violation.	A DSA/TSR update is planned for March 2005.

*Not yet finalized pending further discussion

6.4 Good Practices

It was noted that several sites involve DOE personnel early in the DSA preparation process to provide input to hazard control selection. For example, EM headquarters and site safety basis reviewers have been engaged during DSA preparation at the Oak Ridge Reservation. A control selection meeting is typically held during DSA preparation with a team that includes the contractor's safety analyst, facility management, and operations personnel. The DOE Facility Representative and the DSA Lead Reviewer participate in this meeting to discuss the hazard analysis and agree on the appropriate control set. This process includes a discussion of the SACs, their overall importance and the appropriate level of specificity needed within TSRs.

Another notable practice is related to supplemental EM guidance on 10 CFR 830 (reference 2), which requires DOE safety basis reviewers to evaluate the contractor's TSR implementation strategy and document the adequacy within facility-specific Safety Evaluation Reports. In particular, contractors and DOE reviewers at the Hanford (Richland Field Office) and Oak Ridge sites have adopted a TSR Implementation Verification Review (IVR) process. This process includes a flowdown matrix of how TSR controls (including SACs) will be implemented through specific contractor actions (e.g., facility procedures and training) and verification that actions are complete using facility walkdowns, interviews with facility management and personnel, and review of training records, equipment, and procedures. Implementation plans and flowdown matrices are reviewed by the safety basis reviewer, and the Facility Representative leads an independent review on the completion of contractor actions specified in the implementation plan, as well as from the IVR. Safety basis reviewers and other subject matter experts also participate in this activity.

7.0 CONCLUSIONS

The Office of Environmental Management has exercised its initiative in raising the awareness and expectations across the EM complex regarding the importance of nuclear facility hazard controls. EM has collected and published best practices and lessons learned related to administrative controls (see Reference 2). Several measures have also been taken to strengthen programmatic expectations on the safety basis review process and implementation of hazard controls. Site-specific assessments provided a valuable complement to these activities.

EM is committed to continuous safety improvement. The DNFSB's Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*, as well as the subsequent DOE-STD-1186, have been positive measures for raising awareness of the importance of specific administrative controls. EM will build off progress to date and use the insights gained from site-

specific assessments. Further actions are planned to improve the formulation and derivation of specific administrative controls at EM nuclear facilities.

The following actions are planned over the coming months:

(1) Results of initial assessments conducted at Savannah River and Hanford will be updated based on a supplemental self-assessment process. EM Headquarters will issue lines of inquiry and overall corporate expectations to guides these efforts. A similar approach will be used to evaluate PPPO activities with a particular focus on any changes to contractor and DOE processes since the transition from ORO. These assessment actions will be initiated in January 2005, and results will be communicated to DNFSB together with the results of planned activities focused on specific administrative control implementation. In accordance with Commitment 4.6 of the IP, DOE will be reporting on those efforts in June 2005.

(2) EM-1 recently issued correspondence to EM field sites that require each site to verify closure of corrective actions taken in response to assessment findings and recommendations, and report any remaining actions to be completed (e.g., changes to be made in future annual update cycles of DSA). EM will convey these results to the DNFSB when received.

(3) EM will continue to work with the Office of Environment, Safety and Health on the best strategy for incorporating DOE-STD-1186 into the directives framework supporting 10 CFR 830, Subpart B (i.e., safe harbor standards, DOE G 421.1-2, DOE O 420.1B). This will add clarity to formulation and derivation of specific administrative controls in the context of 10 CFR 830 compliance.

(4) Since there are a number of specific administrative controls that are common to TRU waste operations, EM headquarters will issue guidance to standardize supporting analytical assumptions and derivational bases that impact specific administrative control selection (e.g., vehicle accidents, drum deflagrations, and fire scenarios). This will include assumptions such as container integrity, airborne release fractions, damage ratios, and fire durations and magnitudes. The effort will be accomplished by EM Headquarters in coordination with affected DOE-EM field sites, EH, and the DNFSB staff, as required. Guidance is planned for issuance in late FY 2005.

8.0 REFERENCES

1. Memorandum for Distribution from Jessie Hill Roberson, *Environmental Management Guidelines and Lessons Learned for Nuclear Facility Control Selection and Implementation*, May 20, 2003.

2. Memorandum for Distribution from Jessie Hill Roberson, *Supplemental Environmental Management Guidance for Implementing 10 CFR 830, Subpart B, Safety Basis Requirements*, May 28, 2002.

APPENDIX A - EVALUATION CRITERIA

DSA/TSR Criteria for Selection/Implementation of Administrative Controls	Yes	No	Comments
Hazard/Accident Analysis			
Does the proposed suite of controls presented in the HA/AA reflect an appropriate hierarchy of importance (i.e., give precedence to preventive over mitigative controls, passive over active controls, and engineered safety features/provisions over administrative controls)?			
Are specific administrative controls identified in the DSA that are needed to prevent or mitigate the consequences of an accident? Do ACs have a safety function that is considered to be safety significant or safety class if the function were provided by an SSC?			
Are proposed specific or general administrative controls (i.e., safety management programs) clearly linked to the hazards and accident events in the HA/AA? Do the controls selected adequately reduce the risk?			
Are specific administrative controls credited in lieu of available engineered controls? If yes, is adequate logic/discussion provided to support the selection? Does this explicit treatment also flow into TSR derivation, SMP Chapters, and the TSR?			
Derivation of TSR Controls			
Descriptions of Specific ACs in a DSA must be sufficiently detailed so that a basic understanding is provided of what is controlled and why. The description must include bases information sufficient to derive TSR administrative controls for specific control functions.			
Are TSR administrative controls adequately derived? Justification/Basis provided for selection of AC so that a basic understanding is provided of what is controlled and why. Specificity is adequate to derive TSR administrative controls for specific control functions.			
Where SMPS are credited as a TSR control, is there adequate basis/discussion of specific SMP elements credited in the HA/AA?			

DSA/TSR Criteria for Selection/Implementation of Administrative Controls	Yes	No	Comments
TSRs			
Does the TSR define the ground rules for treating Specific ACs, including treatment of non-compliances as TSR violations?			
Are the safety programs committed to in the DSA and relied on for worker or public safety in the hazard and accident analyses addressed in the Administrative Control section, as appropriate? Descriptions of programs, equipment, and controls should be consistent with the DSA.			
Are specific administrative controls and limits specified in the DSA presented in the TSR? Is rationale for coverage either in LCO format or AC section?			
Are those specific administrative controls written to address an appropriate level of reliability? Do AC s include performance expectation similar to surveillance or independent verification, frequency of performance, etc.?			
Is there a specific commitment to personnel qualification and training? Does this commitment identify the program or requirement that will govern qualification and training? Is there a level of training specified for those that perform under administrative controls?			
Is there a commitment to a program for conducting in-service inspection and testing, and is it consistent with the commitments in DSA? Does it address AC systems as well as LCO equipment?			
Is there a commitment to configuration control? DSA describes the configuration control program and should reference the contractor's procedures and standards. Basic elements should be described.			
Are material inventory controls addressed in the Administrative Controls section? Does this section identify all of the materials that require control to satisfy basic accident assumptions, categorization limits, regulatory limits, etc., which are necessary to remain within the hazard category (typically fissile, radioactive, toxic, explosive, etc.)? Do the material controls identify where the limits apply (total facility, wing, operation, etc.)? Do the material limits address how the limits will be controlled?			

DSA/TSR Criteria for Selection/Implementation of Administrative Controls	Yes	No	Comments
Is fire protection appropriately addressed? Fire protection elements that are important to the identified accident control should be included in an administrative control. If the combustible loading program is credited as important in the accident or hazard analyses, then the document should state a commitment to the program. The combustible loading program should address loading limits (transitory and fixed), as well as the method used to maintain the limits. Commitment to the appropriate National Fire Protection Association standards adopted by the contractor should be noted if they are critical to the safety function of the fire protection program, and they should be consistent with the discussions in the DSA.			
Is the system that governs the production, review, control, use, and revision of procedures (particularly those procedures required to implement the TSR) institutionalized?			
DSA/TSR Implementation Aspects			
Does the contractor have a formal process in place to verify availability and readiness of controls prior to implementation?			
Is there evidence that DSA and TSR controls have been flowed down into contractor procedures and personnel training?			
Does the contractor have a process in place that ensures periodic assessment of hazard control's effectiveness, re-training and qualification of facility personnel, and adherence to a change control process?			

DOE Safety Basis Review Process			
Has DOE participated in control selection during DSA development? Did this process involve EM line management, safety basis reviewers, and the DOE facility representative?			
Has an appropriate level of DOE review been placed on selection and implementation of administrative controls as reflected in DOE Safety Evaluation Reports?			
Does DOE have an institutionalized program to verify implementation and maintenance of TSR controls?			

[1]DSA/TSR implementation is defined as those activities that occur between the issuance of the SER and the effective date of the new DSA/TSR.

[2]These DSA/TSR Implementation Plan questions are applicable to Environmental Management-funded programs (i.e., the Assistant Manager for Environmental Management and the Assistant Manager for Assets Utilization). The DSA/TSR Implementation Plan expectations were provided as Environmental Management Supplemental Guidance on DSA/TSR Implementation in a memorandum from Jessie Hill Roberson, EM-1, dated May 28, 2002.