Independent Oversight Review of the Richland Operations Office Oversight of Implementation Verification Review Processes

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Office of Safety and Emergency Management Evaluations
Office of Enforcement and Oversight
Office of Health, Safety and Security
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Acronyms

AB	Authorization Basis
AMSE	Assistant Manager for Safety and Environment
CFR	Code of Federal Regulations
CHPRC	CH2M Hill Plateau Remediation Company
CRAD	Criteria, Review and Approach Document
DOE	U.S. Department of Energy
DOE-RL	DOE Richland Operations Office
DSA	Documented Safety Analysis
FR	Facility Representative
FY	Fiscal Year
HSS	Office of Health, Safety and Security
IEP	Integrated Evaluation Plan
IVR	Implementation Verification Review
KOP	Knock Out Pot
MOP	Master Oversight Plan
OA	Operational Awareness
ORR	Operational Readiness Review
RA	Readiness Assessment
SSOE	Safety System Oversight Engineer
SWOC	Solid Waste Operations Complex
SWPP	Solid Waste Processing Project
WRAP	Waste Receiving and Processing Facility
WRP	Waste Retrieval Project
TSR	Technical Safety Requirement

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1.0 PURPOSE

This report documents the independent review of implementation verification review (IVR) processes at the Richland Operations Office (DOE-RL) conducted by the Office of Enforcement and Oversight (Independent Oversight), which is within the U.S. Department of Energy's (DOE) Office of Health, Safety and Security (HSS). The onsite review was performed by the HSS Office of Safety and Emergency Management Evaluations from August 13 to 17, 2012, and was carried out within the broader context of an ongoing program of assessments of the execution of IVRs at DOE sites with hazard category 1, 2, and 3 nuclear facilities. The overall purpose of these Independent Oversight reviews is to evaluate the processes and methods used for verifying and re-verifying implementation of new or substantially revised safety basis hazard controls. The objective of this assessment was to evaluate the extent to which the DOE-RL has developed and employed appropriate methods for oversight of contractor implementation verification methods. Independent Oversight's assessment of the independent implementation verification processes of one of DOE-RL's management and operating contractors, CH2M Hill Plateau Remediation Company (CHPRC), is documented in a separate report.

2.0 BACKGROUND

Subpart B of Title 10 Code of Federal Regulations (CFR) 830.201, *Performance of Work*, states, "A contractor must perform work in accordance with the safety basis for a hazard category 1, 2, or 3 DOE nuclear facility and, in particular, with the hazard controls that ensure adequate protection of workers, the public, and the environment." In addition, 10 CFR 830, Subpart A, *Quality Assurance Requirements*, establishes requirements for conducting activities that may affect safety at these facilities, including performing work in accordance with hazard controls, using approved instructions or procedures, conducting tests and inspections of items and processes, and independently assessing the adequacy of work performance.

In February 2008, the Defense Nuclear Facilities Safety Board requested that DOE evaluate the need to conduct "independent validations on a recurring basis" to ensure that facility equipment, procedures, and personnel training related to safety basis controls have not degraded over time. In response, the Department conducted an evaluation that led to the conclusion that the existing requirements for implementation of safety controls and DOE policy for oversight of the implementation of nuclear safety requirements were appropriate. The evaluation also concluded that Departmental directives contained no explicit requirement to validate safety basis hazard controls, so the Department committed to develop guidance on the validation of safety controls and to add that guidance to its directives.

A DOE working group developed a "best practices guide" for the independent validation of safety basis controls. In November 2010, the guidance for performing IVRs was incorporated in DOE Guide 423.1-1A, *Implementation Guide for Use in Developing Technical Safety Requirements*, Appendix D, *Performance of Implementation Verification Reviews (IVRs) of Safety Basis Controls*.

3.0 SCOPE

At the Hanford Site, DOE-RL provides onsite management, day-to-day oversight, and surveillance of DOE-RL mission operations[1], as well as operations and support for accomplishing DOE and Office of Environmental Management strategic and long-term general goals. For this review, Independent Oversight assessed the establishment and execution of DOE-RL processes and activities for verifying the implementation of changes to safety basis hazard controls. This scope is consistent with completion of Objectives 1 and 2 in the HSS Criteria, Review and Approach Document (CRAD) HSS CRAD 45-39, Rev. 1, *Implementation Verification Review of Safety Basis Hazard Controls: Inspection Criteria, Activities, and Lines of Inquiry*. The objectives were to determine whether:

- Processes have been established that provide assurance that safety basis hazard controls are maintained and hazard control changes are correctly implemented.
- CHPRC and DOE-RL have developed and implemented appropriate methods for performing IVRs or similar reviews.

The assessment was accomplished by reviewing the documentation that establishes and governs the Hanford Site and DOE-RL IVR processes (for example, work instructions, procedures, forms, and checklists) and interviewing key personnel responsible for developing and executing the associated practices.

4.0 RESULTS

Objective 1: Processes have been established that provide assurance that safety basis hazard controls are maintained and hazard control changes are correctly implemented.

Independent Oversight reviewed DOE-RL oversight processes to determine whether those processes adequately assess the contractor's implementation of new and revised safety basis documents and provide sufficient information to confirm the ongoing effectiveness of contractor processes for the implementation of safety basis requirements.

DOE-RL conducts oversight of contractor activities in accordance with a formal contractor oversight program plan and an oversight performance process description. The oversight plan is implemented through structured oversight planning and execution processes and procedures. DOE-RL organizations analyze contractor performance and activities and compile an Integrated Evaluation Plan (IEP) each fiscal year (FY) identifying the contractor, facility, and topics subject to oversight; the responsible organization and assessor; and the type of oversight (e.g., assessment, surveillance, or operational awareness). The oversight activities identified in the IEP encompass a variety of mechanisms for verifying the contractors' implementation of controls defined in safety basis documents. These mechanisms include specific oversight of contractor IVRs, performance of readiness reviews, oversight of contractor readiness assessments (RAs), and routine independent verification of safety basis control implementation by Facility Representatives (FRs) and safety system oversight engineers (SSOEs).

Within the safety basis documentation and approval process, the *Implementation Validation Review Oversight* procedure states that IVR oversight is expected for a new documented safety analysis (DSA)

[1]The operations at the Hanford Site are guided by two separate DOE offices, the Richland Operations Office and the Office of River Protection. The DOE Richland Operations Office and DOE Office of River Protection jointly manage the Hanford Site through several contractors and their subcontractors. The DOE Richland Operations Office manages legacy cleanup, research, and other programs at the Hanford Site. The DOE Office of River Protection was established by Congress in 1998 as a field office to manage DOE's largest, most complex environmental cleanup project, Hanford's tank waste retrieval, treatment, and disposal.

and for moderate or major changes to an existing DSA, unless a more formal operational readiness review (ORR) is performed. IVR oversight results can be included in an ORR. Oversight responsibility is assigned to the DOE-RL authorization basis (AB) team and is intended to ensure that controls are incorporated in documents and work instructions, personnel are knowledgeable of controls, and controls are ready and can be implemented. The procedure describes selection of a review team by the AB subject matter expert as the team leader and development of an IVR oversight plan, if needed. The procedure states that the team leader documents the oversight activity as an operational awareness (OA) report in the OA database, or as a surveillance report if there are significant findings that need to be reported to the contractor for corrective action and a formal response. A supplemental guidance document provides more detail regarding this oversight activity, including an IVR checklist and a CRAD. This procedure and its associated guidance documents provide adequate instructions for specific oversight of contractor IVRs.

DOE-RL also has established appropriate processes and procedures for determining or overseeing a contractor's formal evaluations of readiness for startup or restart of hazard category 1, 2, and 3 nuclear facilities, activities, or operations. In cases where there are substantial changes to facilities and processes and the DSA, DOE-RL and the contractor may accomplish the intent of the IVR process within the framework of an RA and/or an ORR. Three levels of RAs are defined. For RA-1, the contractor and DOE-RL perform a review; for RA-2, the contractor conducts the review with DOE-RL oversight; and for RA-3, the contractor conducts the review with DOE-RL oversight of the field portion of the review.

The FRs in the DOE-RL Operations Oversight Division develop quarterly Master Oversight Plans (MOPs) for each project to summarize past performance and identify planned oversight activities, including formal surveillances and routine OA activities. Guidance on routine OA activities includes review of AB documentation and unreviewed safety question screenings and evaluations, monitoring of RAs, and observation of operational activities. In addition, the Operations Oversight Division annually identifies a set of formal "core surveillances" that are included in MOPs. These core surveillances are cross-cutting reviews that evaluate performance and conditions across multiple projects.

The SSOEs' general duties, as outlined in DOE-RL SSOE program documents, include review of the DSA and oversight of the contractor's cognizant system engineering program. SSOEs' specific responsibilities include assessment of contractor compliance with safety basis requirements and the review of test results. The SSOEs are also assigned to periodically conduct safety basis validation – a vertical review of a safety basis parameter, including performance requirements, safety function description, and components' ability to perform the function – and the available criteria, review and approach guidance is sufficient to support safety basis hazard control implementation. SSOE reviews are included in the IEP and are conducted in accordance with the *Oversight Performance* process. The documentation of the reviews may be formal (i.e., surveillance or assessment reports) or informal (i.e., OA reports), depending on whether issues are found; those with issues would be formally documented.

DOE-RL develops and publishes monthly performance "stoplight" charts for each of its contractors, summarizing events and oversight results in various functional areas and noting performance ratings (i.e., green, yellow, or red) and trends in each area and sub-area. Nuclear safety is one of the designated performance areas and includes the sub-areas of nuclear criticality, technical safety requirements (TSRs), unreviewed safety questions, and nuclear safety documentation.

These various defined processes adequately provide for oversight of the contractors' implementation of safety basis controls.

Objective 2: The contractor and site office have developed and implemented appropriate methods for performing IVRs or similar reviews.

Independent Oversight reviewed DOE-RL oversight methods to determine whether they adequately address the implementation of safety basis hazard controls. The review also examined whether the review criteria and approaches are appropriately tailored to the hazard controls being verified and sufficient for the scope of the review, and whether the review activities are sufficiently well documented (in accordance with procedures) to support the conclusions of the review.

Independent Oversight reviewed the IEPs for FY 2011 and FY 2012 and selected a sample of completed nuclear safety-related oversight reports that involved the contractor's implementation of DSA controls for review. Independent Oversight also reviewed the OA database for oversight of IVR and DSA control implementation by FRs. Additionally, oversight planning documents for FR MOPs and a sample of recent MOPs were reviewed for evidence of oversight related to the implementation of DSA-specified controls.

Numerous reports document oversight of contractor IVR and similar activities by DOE-RL technical staff. These reports vary in scope and focus (a few were specific to IVR activities), and most documented FRs witnessing or reviewing the implementation of TSRs or administrative controls. In FY 2009, one of the specified core surveillances was to perform evaluations related to the facility safety bases; this surveillance is scheduled again in FY 2013. The 2009 surveillance, documented in a well written report with appropriately categorized findings, consisted of a rollup of surveillances of DSA and TSR implementation at five facilities. These surveillances involved 13 technical staff members and identified 2 findings, 12 observations, and one good practice. Respectively in FYs 2011 and 2012, twelve and fourteen OA reports, relating in some way to implementation of DSA controls were generated by AB team members and SSOEs. A number of these OA activities, performed by SSOEs, were exceptionally well documented, identifying the specific items evaluated, the acceptance criteria used, and the evaluation results and conclusions.

Notwithstanding the number of oversight reports related to DSA control implementation, Independent Oversight identified a number of weaknesses in the oversight of contractor IVRs and the contractors' IVR processes. Although the operations office technical staff performed many oversight activities related to the implementation of DSA specified controls, DOE-RL has not established a structured process to identify the need for and ensure that IVR oversight of DSA revisions is performed as specified in oversight procedures. Further, this lack of a structured IVR oversight process made it difficult for DOE-RL to demonstrate that the required and sufficient oversight of contractor IVRs and DSA controls implementation was being performed. (See Section 6, OFI-1.)

DOE-RL oversees activities and performance for two contractors who manage and operate a total of more than 20 nuclear facilities with DSAs, each requiring an annual update. Although the AB team is assigned responsibility for oversight of IVRs, only two OA reports that specifically address AB staff oversight of contractor IVR activities in FY 2011 and FY 2012 were identified by DOE-RL and Independent Oversight. The search of FY 2011 and FY 2012 IEPs for oversight reports by FRs and SSOEs identified eight additional OA reports related specifically to oversight of contractor IVR activities at three facilities. However, all but one of these oversight activities, as reported, were limited in scope and report content. Most of the oversight consisted of IVR document reviews after DSA implementation or attendance at project review committee or RA closeout meetings, and Independent Oversight identified only a few actual observations of IVR performance activities (e.g., interviews and field walk downs) or specific independent verification/validation by DOE-RL. Reports were sometimes cryptic in describing what was reviewed (for example, they did not identify the specific documents or tests that were reviewed). None of the oversight activities were team reviews, and none were conducted or reported as formal surveillances, only as informal OA reports. Further, DOE-RL has performed no formal assessment or surveillance of contractor IVR programs in recent years. At the conclusion of this Independent Oversight review, DOE-

RL management stated that they planned to evaluate current procedures and processes with respect to this report in order to identify specific weaknesses and to make revisions, as needed. Further, DOE-RL indicated that a future, follow-on self assessment would be conducted to evaluate the adequacy of the implementation and improvements following any IVR oversight program revisions. (See Section 6, OFI-2 to OFI-6.)

5.0 CONCLUSIONS

In accordance with DOE guidance, DOE-RL has established an appropriate set of policies, procedures, and processes for oversight of nuclear safety for Richland Operations facilities that address verification of the contractors' implementation of safety basis controls at hazard category 1, 2, and 3 nuclear facilities. DOE-RL AB team members, SSOEs, and FRs perform a variety of IVR and similar oversight activities, but there are weaknesses in the planning, performance, and documentation of the oversight of contractor IVR activities. Not all of the contractor's IVR activities are subjected to DOE oversight as required by DOE-RL procedures, much of the IVR oversight activity is limited in scope, and the documentation of IVR oversight activities often lacks sufficient detail to describe the review activities and support the conclusions of the reviewer.

Utilizing their current procedures and processes, DOE-RL will be able to perform an adequate RA of the Sludge Treatment Project facility and equipment modifications that are planned to be completed within the next two years.

6.0 OPPORTUNITIES FOR IMPROVEMENT

During the review, Independent Oversight identified the following opportunities for improvement, as characterized using DOE-RL oversight procedures. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are offered to the site to be reviewed and evaluated by the responsible line management organizations and accepted, rejected, or modified as appropriate, in accordance with site-specific program objectives and priorities.

OFI-1: Consider establishing a formal process to track and report the schedule, complexity (i.e., minor, moderate, or major), and status of DSA changes to better support oversight planning and provide assurance that oversight of safety basis hazard controls implementation is being performed as required.

OFI-2: Consider reviewing and revising the oversight process and procedure for IVR implementation to clarify responsibilities and to include expectations for better coordination and integration of Assistant Manager for Safety and Environment (AMSE) technical staff (e.g., AB team members, SSOEs, and FRs) in conducting oversight of contractor IVRs and similar processes.

OFI-3: Consider performing formal team surveillances rather than informal OAs for more significant DSA revisions.

OFI-4: Consider periodically conducting independent IVRs and assessments of the contractor's IVR program to ensure that the contractor is implementing the site IVR processes effectively.

OFI-5: Consider providing additional guidance and formal management review and feedback to the technical staff to improve the quality and content of OA reports. Focus on ensuring that oversight reports provide sufficient detail about what was evaluated and what criteria were used, and that they clearly delineate the results.

OFI-6: Consider mechanisms to ensure that DOE-RL staff performance evaluations related to oversight of IVR and similar processes focus on the content and quality of reporting rather than meeting a numerical goal for surveillances and OAs.

7.0 FOLLOW-UP ITEMS

Independent Oversight will follow up on the corrective actions for the DOE-RL self-assessment and any actions resulting from this assessment as part of its normal operational awareness activities under the site lead program.

Appendix A
Supplemental Information

Dates of Review

Onsite Review: August 13-17, 2012

Office of Health, Safety and Security Management

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Independent Oversight Reviewers

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Robert Compton
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Appendix B
Documents Reviewed, Interviews, and Observations

Documents Reviewed

- RL Oversight of Contractors Program Plan, December 2009
- Oversight Performance crosscutting process description and associated procedures on technical surveillances, technical assessments, corrective action management, and monitoring contractor activities, January 2010
- Oversight Planning crosscutting process description, August 2011
- Integrated Evaluation Planning procedure,
- FY 2011 RL Integrated Evaluation Plan
- FY 2012 RL Integrated Evaluation Plan
- Safety Documentation Review and Approval Process Description, January 2010
- Authorization Basis procedure, January 2010
- Implementation Validation Review Oversight Procedure, January 2010
- Implementation Validation Review Oversight Guidance, January 2010
- Performance Evaluation and Reporting strategy document, March 2010
- Call letter to RL Safety and Engineering Division (SED) staff for input to 2013 IEP, August 15, 2012
- 2012 Contractor Oversight Plan
- List of "Core Surveillance" for FY 2013 Facility Representative Master Oversight Plans, August 2, 2012
- RL Facility Representative Program Instruction FRI 005, *Master Oversight Plans*, 3/7/12
- RL-0011, Plutonium Finishing Plant Closure Project FR Master Oversight Plan for 4th Quarter FY 2012
- RL-013, Waste and Fuels Management Project (WRP, SWPP, WRAP) Oversight Plan for 4th Quarter FY 2010
- RL-013, Waste and Fuels Management Project (SWOC) Oversight Plan for 4th Quarter FY 2012
- RL Facility Representative Program Instruction FRI 015, *Standing Instructions*, 2012
- RL Safety System Oversight Engineer (SSOE) Assignments and Vital Safety Systems (VSS) Listing, April 19, 2011
- Safety System Oversight Program Description, July 2011
- Safety System Oversight Engineer (SSOE) Qualification Program, July 2011
- Facility Startup and Restart crosscutting process description, December 2010
- AMSE Monthly Performance Charts for CHPRC for December 2011 through June 2012
- Sludge Treatment Plant KOP Processing System (KPS) Startup Oversight Report, June 21, 2012
- Surveillance Report S-09-OOD-BOS D&D-002, DSA and TSR Implementation Review, 3/30/09
- Surveillance Report S-09-OOD-LWFS-003, DSA and TSR Implementation Review, 3/24/09
- Surveillance Report S-09-OOD-PFP-003, DSA and TSR Implementation Review, 3/31/09
- Surveillance Report S-09-OOD-SNF-002, DSA and TSR Implementation Review, 3/28/09
- Surveillance Report S-09-OOD-SWOC-002, DSA and TSR Implementation Review, 3/31/09
- Surveillance Report S-11-SED-PRC-011, Oversight Surveillance of CHPRC High Efficiency Particulate Air (HEPA) Filter Program, May 2011
- Surveillance Report S-10-SED-PRC-024, Safety Basis Validation Review – 0.1 Passive Leak path Factor (LPF), April 21, 2010
- Approximately 75 Operational Awareness Reports generated by FRs, AB engineers, and SSOEs from 2009 through 2012 and related to oversight of contractor implementation of safety basis controls
- Assessment/Surveillance Criteria, Review, and Approach Document Guidance, Various

Interviews

- Assistant Manager, Safety and Environment
- Acting Assistant Manager, Operations Oversight Division
- Manager, Safety and Engineering Division
- Acting Lead, Facility Representative Team
- Lead, Authorization Basis Team
- Heating, Ventilation, and Air Conditioning (HVAC) Safety System Engineer
- Plutonium Finishing Plant Project Authorization Basis engineer
- Authorization Basis Criticality Safety Subject Matter Expert
- 100K Project Authorization Basis engineer