Safety Basis Training and Qualification Assessment at the Hanford Site

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Office of Enterprise Assessments
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Acronyms

CAP	Corrective Action Plan
CFR	Code of Federal Regulations
CHPRC	CH2M HILL Plateau Remediation Company
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
OFI	Opportunity for Improvement
RL	Richland Operations Office

Safety Basis Training and Qualification Assessment at the Hanford Site November 4-8, 2019

Summary

Scope

This assessment evaluated the effectiveness of the CH2M HILL Plateau Remediation Company (CHPRC) training and qualification program and processes that ensure safety basis development personnel possess and retain the knowledge and skills to effectively produce and maintain safety basis documentation. This assessment also evaluated the CHPRC quality improvement processes implemented to continually improve safety basis development processes and products.

Significant Results for Key Areas of Interest

Overall, CHPRC has established and effectively implemented a rigorous training and qualification program for nuclear safety engineers, analysts, and managers/leads. CHPRC has taken effective actions to evaluate and improve the effectiveness of their processes for developing and assuring the quality of safety basis documentation. Weaknesses were identified in the areas of: continuing training; performance requirements for the nuclear safety engineer qualification process; periodic analysis of comments received on safety basis document submittals; and the scope of assessments of the nuclear safety training and qualification program.

Safety Basis Training and Qualification

Overall, CHPRC has developed and implemented a training and qualification program for nuclear safety personnel that meets the requirements of DOE Order 426.2 for a systematic approach to training. The vast majority of CHPRC nuclear safety personnel have extensive experience in the nuclear safety field and a sampling of these experienced personnel confirmed an expert level of knowledge of DOE's safety basis requirements, standards, and guidance. However, weaknesses in knowledge and understanding were noted in some of the less experienced nuclear safety engineers. In addition, the continuing training program for nuclear safety personnel does not meet the testing requirements of DOE Order 426.2 and was identified as a deficiency.

Safety Basis Quality Improvement Processes

The CHPRC actions implemented since 2017 to improve the quality of safety basis documents have generally been successful; however, significant comments on safety basis documents generated during the review and approval process are not periodically analyzed to support continuous improvement. Overall, the CHPRC assessment program is adequately applied to the CHPRC nuclear safety program, although the DOE-STD-1070-94 systematic assessments of the CHPRC training program do not sufficiently evaluate the nuclear safety training and qualification program effectiveness.

Best Practices and Findings

No best practices or findings were identified as part of this assessment.

Follow-up Actions

No follow-up activities are planned.

Safety Basis Training and Qualification Assessment at the Hanford Site

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Nuclear Safety and Environmental Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the effectiveness of training and qualification for CH2M HILL Plateau Remediation Company (CHPRC) safety basis development personnel at the Hanford Site. The assessment team performed the onsite portion of this assessment November 4-8, 2019.

In accordance with the *Plan for the Safety Basis Training Assessment at the Hanford Site, November 2019*, this assessment evaluated the effectiveness of the CHPRC training and qualification program and processes that ensure safety basis development personnel possess and retain the knowledge and skills to effectively produce and maintain safety basis documentation. This assessment also evaluated the CHPRC quality improvement processes implemented to continually improve safety basis development processes and products.

For most Hanford nuclear facilities, CHPRC personnel are responsible for developing and maintaining technically adequate safety basis documents that are compliant with 10 CFR 830, Subpart B, *Safety Basis Requirements*. These safety basis documents provide reasonable assurance that workers, the public, and the environment are adequately protected from adverse consequences, taking into account the work to be performed and the associated hazards.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which is implemented through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. This report uses the terms "best practices, deficiencies, findings, and opportunities for improvement (OFIs)" as defined in DOE Order 227.1A.

As identified in the assessment plan, this assessment considered requirements for the training and qualification of CHPRC safety basis development personnel based on 10 CFR 830, Subpart A, *Quality Assurance Requirements*; DOE Order 426.2, Change 1, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*; selected criteria from DOE-STD-1070-94, *Criteria for Evaluation of Nuclear Facility Training Programs*; and selected feedback and improvement criteria from DOE Guide 226.1-2A, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*, Appendix D, *Activity Level Work Planning and Control Criterion Review and Approach Documents with Lines of Inquiry*.

The assessment team examined key documents, such as training program documents, procedures, and policies; training and qualification records; corrective action plans (CAPs); review and comment records; assessment reports; and continuing training documentation. The assessment team also conducted interviews with nuclear safety personnel from DOE's Richland Operations Office (RL) and CHPRC. The members of the assessment team, the Quality Review Board, and management responsible for this assessment are listed in Appendix A.

There were no items for follow-up during this assessment.

3.0 RESULTS

3.1 Safety Basis Training and Qualification

The objective of this portion of the assessment was to evaluate the training and qualification processes and programs that ensure safety basis development personnel possess and retain the knowledge and skills to effectively produce and maintain safety basis documentation.

Training and Qualification Program

Training processes required by 10 CFR 830, Subpart A, and DOE Order 426.2 are described in CHPRC's PRC-PRO-TQ-40165, *Training Program Administration*, and provide a systematic approach to training. In addition, as required by DOE Order 426.2, CHPRC has developed and maintains a training implementation matrix, PRC-STD-TQ-40201, *CH2M HILL Plateau Remediation Company Training Implementation Matrix*. This matrix adequately identifies training requirements for the qualification of nuclear safety engineers, analysts, and managers/leads for hazard category 1, 2, and 3 nuclear facilities.

CHPRC employs 29 qualified nuclear safety personnel (1 nuclear safety manager, 6 nuclear safety leads, 3 nuclear safety analysts, and 19 nuclear safety engineers) to support the safety basis work for the CHPRC-managed Hanford nuclear facilities. PRC-STD-TQ-40263, *Nuclear Safety Training Program Description,* specifies qualification requirements for personnel performing nuclear safety work. Job task and training needs analyses provide an appropriate foundation for the qualification process for nuclear safety engineers, analysts, and managers/leads. Training plans reviewed were adequate, being based on standard position-specific templates and then tailored to individual experience, training needs, and assigned responsibilities. Completion of a position-specific qualification card is required by PRC-STD-TQ-40263 for each of these positions. With the exception of the weakness discussed in the next subsection concerning performance requirements for nuclear safety engineers, the qualification cards reviewed were appropriate.

Of the 29 qualified nuclear safety personnel, 13 are subcontractor employees. Section 3.6 of PRC-PRO-TQ-40164*, Personnel Training and Qualification*, defines the methods to qualify subcontractor employees. All subcontractor employees filling nuclear safety engineer, analyst, and lead positions are qualified in the same manner as CHPRC employees and required to maintain the same level of proficiency. This approach is effective for ensuring the technical competency of subcontractor employees.

CHPRC's continuing training program for nuclear safety personnel is adequately defined in PRC-STD-TQ-40263. Consistent with DOE Order 426.2, Attachment 1, Chapter I, Section 7, *Continuing Training*, CHPRC has established and implemented continuing training requirements for maintaining the proficiency and qualifications of nuclear safety engineers, analysts, and managers/leads on the required two-year cycle. Although these requirements are generally adequate, CHPRC does not require the administration and documentation of periodic examinations or proficiency evaluations on material included in the program, contrary to DOE Order 426.2, Attachment 1, Chapter I, Section 7. (See **Deficiency D-CHPRC-1**.)

Safety Basis Personnel Knowledge, Skills, and Abilities

The assessment team interviewed 7 of 19 qualified nuclear safety engineers, 2 of 6 qualified nuclear safety leads, and the nuclear safety manager; most demonstrated an expert level of knowledge of DOE's safety basis requirements, standards, and guidance. However, weaknesses in knowledge and understanding of DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, were noted in some of the less experienced nuclear safety engineers. These weaknesses

correlated with the experience level of the nuclear safety engineers and the types of assignments (e.g., only minor changes and updates to existing safety basis documents) they had been given during and after their qualification. Based on this observation, the assessment team concluded that the qualification process does not include sufficient performance requirements for developing safety basis documents to attain the necessary level of proficiency. (See **OFI-CHPRC-1**.)

Safety Basis Training and Qualification Conclusions

Overall, CHPRC has developed and implemented a training and qualification program for nuclear safety personnel that meets the requirements of DOE Order 426.2 for a systematic approach to training. The vast majority (26 of 29) of CHPRC nuclear safety personnel have extensive experience in the nuclear safety field and a sampling of these experienced personnel confirmed an expert level of knowledge of DOE's safety basis requirements, standards, and guidance. However, weaknesses in knowledge and understanding were noted in some of the less experienced nuclear safety engineers. In addition, the continuing training program for nuclear safety personnel does not meet the testing requirements of DOE Order 426.2.

3.2 Safety Basis Quality Improvement Processes

The objective of this portion of the assessment was to evaluate the quality improvement processes implemented to continually improve safety basis development processes and products.

Quality Improvement Processes for Safety Basis Documentation

In a January 3, 2017, letter, RL directed CHPRC to develop a CAP to address significant quality issues with several safety basis documents that had been submitted for RL approval. RL nuclear safety personnel interviewed indicated that the implemented corrective actions were effective at improving the quality and compliance to requirements of submitted safety basis documents, and substantial improvements in the quality of recent safety basis document submittals were evident. A corrective action to develop and implement a performance metric on the numbers and types of RL comments received on safety basis documents submitted for review and approval was effectively implemented and used. However, CHPRC and RL compliance and technical comments relating to major or recurring issues are not periodically analyzed or factored into continuing training or compliance checklists. (See **OFI-CHPRC-2**.)

CHPRC has adequate corporate lessons learned processes, but they are used sparingly (e.g., during biennial continuing training) by the nuclear safety organization. Lessons learned relating to the development of safety basis documents are communicated informally during morning meetings and periodic staff meetings. These lessons learned are not a documented part of the continuing training program, but interviews of nuclear safety personnel confirmed the effectiveness of several lessons learned topics that had been informally discussed during morning meetings and periodic staff meetings.

Management and Independent Assessments

PRC-PRO-QA-40091, *Integrated Assessment Planning*, is a comprehensive assessment scheduling process that includes required and functional manager-initiated management (self) assessments, work site (checklist) assessments, and surveillances. Twelve assessment reports were reviewed and found to be thorough, criteria-based, straightforward evaluations of the subject areas. In the last two years, an average of two management assessments per year (which met CHPRC corporate expectations) were conducted in the nuclear safety program area, in addition to the recurring verification of key elements of the safety management program. The issues that were identified during these assessments were

appropriately entered into the issues management system for evaluation and corrective action. The only recent independent assessment was the effectiveness review performed as a corrective action under the RL-directed CAP discussed above.

PRC-PRO-TQ-40165, Section 3.5.3, *Evaluation of Training Program*, Step 12, requires the training manager to conduct periodic (not to exceed three years), systematic evaluations of the overall CHPRC training program in accordance with DOE-STD-1070-94. The assessment team reviewed 10 assessments conducted from 2014 to 2019. These assessments covered the standard's 8 objectives and 36 associated criteria in certain facilities (although not all objectives and associated criteria in every facility) every three years. One assessment, PTS-2018-WSA-16323, *Training and Qualification*, June 19, 2018, included verification of one criterion of the nuclear safety training and qualification program, an evaluation of Criterion 4.3 (training for technical staff personnel is based on an assessment of position duties and responsibilities) for the three nuclear safety qualification standards, and concluded that the three standards were based on a training needs analysis. A review of just 1 of the 36 criteria listed in DOE-STD-1070-94 in two assessment cycles does not provide a meaningful evaluation of the nuclear safety training and qualification program. While the 10 site-level DOE-STD-1070-94 assessments conducted over the last six years are current and generally acceptable in programmatic scope, they did not sufficiently evaluate the content or adequacy of the nuclear safety training and qualification program. (See **OFI-CHPRC-3**.)

Safety Basis Quality Improvement Processes Conclusions

The CHPRC actions implemented since 2017 to improve the quality of safety basis documents have generally been successful; however, significant comments on safety basis documents generated during the review and approval process are not periodically analyzed to support continuous improvement. Overall, the CHPRC assessment program is adequately applied to the CHPRC nuclear safety program, although the DOE-STD-1070-94 systematic assessments of the CHPRC training program do not sufficiently evaluate the nuclear safety training and qualification program effectiveness.

4.0 BEST PRACTICES

There were no best practices identified as part of this assessment.

5.0 FINDINGS

There were no findings identified as part of this assessment.

6.0 DEFICIENCIES

Deficiencies are inadequacies in the implementation of an applicable requirement or standard. Deficiencies that did not meet the criteria for findings are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

CHPRC

D-CHPRC-1: CHPRC does not require the administration and documentation of periodic examinations or proficiency evaluations on material included in its continuing training program for nuclear safety personnel. (DOE Order 426.2, Change 1, Attachment 1, Chapter I, Section 7)

7.0 OPPORTUNITIES FOR IMPROVEMENT

The assessment team identified three OFIs to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in assessment reports, they may also address other conditions observed during the assessment process. These OFIs are offered only as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

CHPRC

OFI-CHPRC-1: CHPRC should consider enhancing the performance requirements for the initial training and qualification of nuclear safety engineers who do not already have significant nuclear safety experience.

OFI-CHPRC-2: CHPRC should consider reviewing internal and external comments generated during the review and approval process for safety basis documents to develop improvement actions for safety basis documents.

OFI-CHPRC-3: CHPRC should consider implementing a more systematic approach for determining the scope of DOE-STD-1070-94 assessments to ensure that they adequately evaluate all qualification programs included in CHPRC's Training Implementation Matrix.

Appendix A
Supplemental Information

Dates of Assessment

Onsite Assessment: November 4-8, 2019

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