



CH2M HILL Plateau Remediation
Company, Inc.
Plateau Remediation Contract
Hanford Site

**Report from the Department of Energy
Voluntary Protection Program
Onsite Review
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Foreword

The Department of Energy (DOE) recognizes that true excellence can be encouraged and guided but not standardized. For this reason, on January 26, 1994, the Department initiated the DOE Voluntary Protection Program (VPP) to encourage and recognize excellence in occupational safety and health protection. This program closely parallels the Occupational Safety and Health Administration (OSHA) VPP. Since its creation by OSHA in 1982, and implementation by DOE in 1994, VPP has demonstrated that cooperative action among Government, industry, and labor can achieve excellence in worker safety and health. The Office of Health, Safety and Security (HSS) assumed responsibility for DOE-VPP in October 2006. HSS is expanding complex-wide contractor participation and coordinating DOE-VPP efforts with other Department functions and initiatives, such as Enforcement, Oversight, and the Integrated Safety Management System.

DOE-VPP outlines areas where DOE contractors and subcontractors can surpass compliance with DOE orders and OSHA standards. The program encourages a *stretch for excellence* through systematic approaches, which emphasize creative solutions through cooperative efforts by managers, employees, and DOE.

Requirements for DOE-VPP participation are based on comprehensive management systems with employees actively involved in assessing, preventing, and controlling the potential health and safety hazards at their sites. DOE-VPP is available to all contractors in the DOE complex and encompasses production facilities, laboratories, and various subcontractors and support organizations.

DOE contractors are not required to apply for participation in DOE-VPP. In keeping with OSHA and DOE-VPP philosophy, *participation is strictly voluntary*. Additionally, any participant may withdraw from the program at any time. DOE-VPP consists of three programs with names and functions similar to those in OSHA's VPP: Star, Merit, and Demonstration. The Star program is the core of DOE-VPP. This program is aimed at truly outstanding protectors of employee safety and health. The Merit program is a steppingstone for participants that have good safety and health programs, but need time and DOE guidance to achieve true Star status. The Demonstration program, expected to be used rarely, allows DOE to recognize achievements in unusual situations about which DOE needs to learn more before determining approval requirements for the Merit or Star program.

By approving an applicant for participation in DOE-VPP, DOE recognizes that the applicant exceeds the basic elements of ongoing, systematic protection of employees at the site. The symbols of this recognition provided by DOE are certificates of approval and the right to use flags showing the program in which the site is participating. The participant may also choose to use the DOE-VPP logo on letterhead or on award items for employee incentive programs.

This report summarizes the results from the evaluation of CH2M Hill Plateau Remediation Company, Inc. (CHPRC), during the period of January 7-16, 2014, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding CHPRC's continued participation in DOE-VPP.

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS	iii
EXECUTIVE SUMMARY	v
OPPORTUNITIES FOR IMPROVEMENT	vii
I. INTRODUCTION	1
II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE	3
III. MANAGEMENT LEADERSHIP	4
IV. EMPLOYEE INVOLVEMENT	9
V. WORKSITE ANALYSIS	13
VI. HAZARD PREVENTION AND CONTROL	17
VII. SAFETY AND HEALTH TRAINING	21
VIII. CONCLUSIONS	23
Appendix A	A-1

ABBREVIATIONS AND ACRONYMS

AMW	ALARA Management Worksheet
ARRA	American Recovery and Reinvestment Act
AJHA	Automated Job Hazard Analysis
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CGET	CHPRC General Employee Training
CHA	Craft-Specific Job Hazard Analysis
CHPRC	CH2M Hill Plateau Remediation Company, Inc.
CRRS	Condition Reporting and Resolution System
D&D	Deactivation and Decommissioning
DART	Days Away, Restricted or Transferred
DOE	Department of Energy
EJTA	Employee Job Task Analysis
ELM	Enterprise Learning Management
EMS	Environment Management System
EPHA	Emergency Planning Hazard Assessment
ESRB	Executive Safety Review Board
EZAC	Employee Zero Accident Council
FFTF	Fast Flux Test Facility
GHA	General Industrial Hazard Analysis
HAMMER	Volpentest Hazardous Materials Management and Emergency Response Training Center
HAMTC	Hanford Atomic Metal Trades Council
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEC	Hazardous Energy Control
HGET	Hanford General Employee Training
HPMC	HPM Corporation
HRB	Hazard Review Board
HSS	Office of Health, Safety and Security
HSWET	Hanford Site Worker Eligibility Tool
IHEA	Industrial Hygiene Exposure Assessment
ISMS	Integrated Safety Management System
ITEM	Integrated Training Electronic Matrix
JCS	Job Control System
MSA	Mission Support Alliance, LLC
NAICS	North American Industry Classification System
ORPS	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
PAPR	Powered Air Purifying Respirator
PFP	Plutonium Finishing Plant
POMC	Performance Objectives, Measures, and Commitments
PPE	Personal Protective Equipment
PZAC	President's Zero Accident Council
RL	Richland Operations Office
RWP	Radiological Work Permit
S&GRP	Soil and Groundwater Remediation Project

SCWE	Safety Conscious Work Environment
SME	Subject Matter Expert
Team	HSS DOE-VPP Team
TRC	Total Recordable Case
VPP	Voluntary Protection Program
VPPPA	Voluntary Protection Programs Participants' Association
WHA	Worksite Hazard Analysis

EXECUTIVE SUMMARY

CH2M Hill Plateau Remediation Company, Inc. (CHPRC), is a Washington State company formed by CH2M HILL Constructors, Inc. CHPRC is the prime contractor for the safe, environmental cleanup of the Central Plateau at the Hanford Site. CHPRC is responsible for waste retrieval and fuels management, groundwater and vadose zone¹ remediation, demolition of facilities and canyons, and closure of the Plutonium Finishing Plant. CHPRC initially applied to Department of Energy (DOE) Voluntary Protection Program (VPP) as a transitional Star participant. Under the provisions in DOE-VPP the Office of Health, Safety and Security (HSS) performed an onsite evaluation in March 2011. That assessment determined that although CHPRC had made significant progress toward achieving Star status for the Company as a whole, changes to the program scope and structure under the new contract were more extensive than originally anticipated. CHPRC needed to deal with a variety of issues, such as worker distrust and fear of retaliation. As a result, CHPRC was admitted to DOE-VPP as a new applicant at the Merit level while it addressed those issues.

To help CHPRC progress from Merit participant to Star status, HSS planned to conduct annual reevaluations. However, in 2011, the Hanford Atomic Metal Trades Council's (HAMTC) bargaining agreement expired and contract negotiations protracted over the ensuing 2 years. As a result, HSS delayed its onsite assessment until negotiations were complete and the new bargaining agreement was in place. HAMTC and CHPRC finally completed those negotiations in October 2013, and the new agreement was effective November 11, 2013. HSS performed the onsite assessment from January 7-16, 2014. This report contains the results of that assessment, and provides the HSS DOE-VPP Team's (Team) recommendation to the Chief Health, Safety and Security Officer.

The Total Recordable Case (TRC) rate increased in 2013 from the prior year, reversing the previously downward trend. CHPRC personnel attribute the rise in annual rate to employee distractions about budget uncertainty, government shutdown, and potential layoffs. Based on improving trends in the second half of calendar year 2013, CHPRC is addressing these issues. Based on periodic reviews by DOE's Richland Operations Office (RL), discussions with RL subject matter experts, and the Team's review of accident and injury logs, CHPRC is appropriately reporting and managing occupational accidents and injuries.

CHPRC has significantly improved its management leadership. Managers are more visible in the workplace, although many workers would like to see even more manager presence. Efforts to train and coach managers at all levels are demonstrating effectiveness. Schedule pressures evident during the 2011 review have been removed, and managers consistently echoed the belief that stopping work when questions or concerns arose was essential to long-term success.

Employee Involvement is evident across most of the CHPRC projects. The President's Zero Accident Council and Employee Zero Accident Council function as effective conduits for raising and addressing safety concerns. Most employees engage and contribute to safety and process improvements by offering suggestions and ideas captured in safety logbooks, communications with supervisors, and interaction with HAMTC safety representatives. However, a segment of the worker population believes managers are not effectively communicating Company and

¹ The part of the Earth between the surface and the water table.

project expectations. CHPRC is taking positive steps to reach out to that segment, build trust, and encourage them to become part of the solution and contribute to the project's success.

CHPRC has established programs for analyzing hazards during the work planning process. CHPRC can benefit by improved worksite analysis procedural changes that document and institutionalize the hazards analysis. CHPRC can further strengthen worker involvement in the hazard analysis process.

CHPRC has successfully implemented the hierarchy of controls. It has introduced improvements with new technologies and lessons learned, and allows workers to make improvements in controls to reduce hazards. CHPRC has worked to resolved medical restriction issues related to the employee job task analysis.

CHPRC continues to maintain an effective training program that ensures trained and qualified workers can perform their job functions safely. A recent Safety Conscious Work Environment survey motivated CHPRC to enhance frontline supervisors' skills by developing a Leadership Impact Initiative. This initiative focuses on core leadership principles and communication skills. In addition, CHPRC provides quarterly fieldwork supervisor training to frontline supervisors to augment their development as managers.

Notwithstanding increase in TRC incidence rates experienced in early 2013, CHPRC has made significant improvements in its safety programs since 2011. Despite many challenges and distractions related to collective bargaining negotiations and funding uncertainty, managers and workers have both sought improvements in Management Leadership and Employee Involvement. Some workers continue to be skeptical of managers, but managers are working to improve communication and trust. Improvements in work planning and control, increased manager visibility in the workplace, and continued efforts to more effectively involve workers and actively seek their opinions and ideas a demonstrative of the continuous improvement expected of DOE-VPP participant. The Team recommends that CHPRC continue to participate in DOE-VPP and be elevated to Star status.

**TABLE 1
OPPORTUNITIES FOR IMPROVEMENT**

Opportunity for Improvement	Page
CHPRC should encourage managers to reward and recognize workers for effectively contributing to working safely, and ensure those rewards are meaningful to workers for reasons other than the cash value of the award.	6
CHPRC should continue to work with RL to replace POMC goals related to TRC and DART case rates with positive incentives directly linked to contractor actions that will prevent accidents and injuries.	6
CHPRC managers should regularly schedule field visits in combination with the HAMTC Safety Representatives.	8
CHPRC managers should continue or expand their efforts to meet with small groups of workers, asking them "What bugs you?"	8
CHPRC managers should ensure workers are apprised of, and involved with, setting project milestones, identifying solutions to technical issues, and given the opportunity to regularly voice their concerns in a safe, nonthreatening forum.	8
CHPRC should ensure managers increase their attention to all forms of hazard identification, including logbooks, round sheets, and safety logbooks, and immediately mitigate the condition until they can implement permanent solutions.	11
CHPRC should establish a regular and frequent mechanism at PFP for managers to communicate directly with the workers, discuss success stories, recognize worker input, provide status of milestones, highlight recent changes, identify impediments to performing work, control rumors, identify management concerns, and discuss other items important to the workers.	12
CHPRC should increase worker participation early in the procedure definition and development process to improve worker ownership and understanding of the final work instructions.	12
CHPRC should document the basis for determining that work is repetitive within the JCS, and ensure assumptions regarding worker proficiency, scope of work, existing hazards, and controls remain consistent with that original determination.	14
CHPRC should revise PRC-PRO-WKM-12115 to require worker participation on the Work Planning Team and involvement in the hazards analysis and controls process, and ensure participation of workers.	14
CHPRC should evaluate a broader sample of active work packages to confirm the completion of IHEAs when required.	15
CHPRC should develop a more systematic method to collectively evaluate, track, and trend data from the Safety and Health Inspection Program to identify potential programmatic issues and corrective actions.	16

I. INTRODUCTION

CH2M Hill Plateau Remediation Company, Inc. (CHPRC), is a Washington State company formed by CH2M HILL Constructors, Inc. CHPRC is the prime contractor for the safe, environmental cleanup of the Central Plateau at the Hanford Site. CHPRC is responsible for waste retrieval and fuels management, groundwater and vadose zone remediation, demolition of facilities and canyons, and closure of the Plutonium Finishing Plant (PFP). Along the Columbia River, CHPRC is also remediating the 100-K Area, which includes preparing for the treatment of highly radioactive sludge that is now in the K-West Basin, where it will be stored until it can be treated. In 2008, the Department of Energy (DOE) awarded CHPRC the 10-year (5-year base period with an option to extend for an additional 5 years), \$4.5 billion Plateau Remediation Contract. The DOE Richland Operations Office (RL) provides day-to-day oversight and management of the Plateau Remediation Contract.

CHPRC initially applied to the DOE Voluntary Protection Program (VPP) as a transitional Star participant. Under the provisions in DOE-VPP, the Office of Health, Safety and Security (HSS) performed an onsite evaluation in March 2011. That assessment determined that although CHPRC had made significant progress toward achieving Star status for the Company as a whole, changes to the program scope and structure under the new contract were more extensive than originally anticipated. CHPRC needed to deal with a variety of issues, such as worker distrust and fear of retaliation. CHPRC was admitted to DOE-VPP as a new applicant at the Merit level while it addressed those issues.

The Plateau Remediation Contract is a performance-based contract designed to focus on cleanup of the 100-K Area, the central portion of the Hanford Site, and the groundwater beneath the entire Hanford Site (River Corridor and Central Plateau). The scope includes: moving K-Basin sludge to the Central Plateau, treating and storing the sludge, and closure of the 100-K facilities and waste sites; placing K-East and K-West Reactors in Interim Safe Storage; treatment and disposition of low-level, mixed low-level, and transuranic wastes; retrieval of suspect, post-1970 transuranic waste; monitoring, characterization, and remediation of groundwater and waste sites; shipment of special nuclear materials offsite; cleanout and demolition to slab-on-grade of PFP; cleanout and demolition of selected industrial and nuclear facilities; near-term shutdown activities of Fast Flux Test Facility (FFTF); and long-term surveillance and maintenance of decommissioned facilities and waste sites.

Since 2011, CHPRC has reorganized with the primary work contained within three major project organizations: the PFP Closure Project; the Decontamination, Waste, Fuels, and Remediation Services Project; and the Soil and Groundwater Remediation Project (S&GRP). A Safety, Health, Security, and Quality organization and a Project Technical Services organization, both headed by a company vice president, support the project organizations.

To help CHPRC progress from Merit participant to Star status, HSS planned to conduct annual reevaluations. However, in 2011, the Hanford Atomic Metal Trades Council (HAMTC) bargaining agreement expired, and contract negotiations protracted over the ensuing 2 years. Because of contract and funding uncertainties, HSS delayed its onsite assessment until negotiations were complete and the new bargaining agreement was in place. CHPRC and HAMTC finally completed those negotiations in October 2013, and the new agreement was effective November 11, 2013.

In 2009, CHPRC received \$1.3 billion of the American Recovery and Reinvestment Act (ARRA) funding from RL to demolish nuclear and support facilities, remediate waste sites, remediate contaminated groundwater, and retrieve solid waste from burial grounds. The use of ARRA funds was designated to accelerate cleanup of facilities, waste sites, and groundwater along the Columbia River to support shrinking the active area of cleanup at the 586-square-mile Hanford Site to 75 square miles or less by 2015. To support that objective, CHPRC committed to advance the cleanup of the central portion of the Hanford Site (known as the 200-Area, or the Central Plateau), which once housed five chemical separations buildings and other facilities that separated and recovered plutonium and other materials for use in nuclear weapons. Since 2011, that funding and activities are complete, and CHPRC has downsized significantly from 3,500 people in 2011 to its current size of approximately 1,400 people.

The workforce consists of multiple unions with all represented through HAMTC (approximately 700 workers), managers, and other exempt and nonexempt personnel. Workers face the full spectrum of industrial, radiological, and chemical hazards associated with remediation and cleanup of nuclear facilities and waste burial grounds.

HSS performed the onsite assessment from January 7-16, 2014. The review consisted of fieldwork observations and walkdowns in all project areas; interviews with workers, supervisors, and managers; and review of procedures, work packages, and other records. This report contains the results of that assessment and provides the HSS DOE-VPP Team's (Team) recommendation to the Chief Health, Safety and Security Officer.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (CHPRC)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	DART* Cases	DART* Case Rate
2011	3,687,574	21	1.14	9	0.49
2012	2,187,080	12	1.1	5	0.46
2013	1,972,767	14	1.42	9	0.91
3-Year Total	7,847,421	47	1.2	23	0.59
Bureau of Labor Statistics (BLS-2012) average for NAICS** # 562 (Waste Management and Remediation Services)			5.4		3.4
Injury Incidence/Lost Workdays Case Rate (CHPRC Subcontractors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2011	3,490,086	16	0.92	3	0.17
2012	1,509,135	0	0	0	0
2013	855,039	1	0.23	0	0
3-Year Total	5,854,260	17	0.58	3	0.1
Bureau of Labor Statistics (BLS-2012) average for NAICS** # 562 (Waste Management and Remediation Services)			5.4		3.4

* Days Away, Restricted or Transferred

** North American Industry Classification System

TRC Incidence Rate, including subcontractors: 0.93***DART Case Rate, including construction and subcontractors: 0.38***

TRC rates increased 29 percent in 2013, reversing the previously downward trend. Of the 14 injury/illness cases, at least 5 cases involved trips and falls. CHPRC attributes the rise in annual rates to employee distractions about budget uncertainty, government shutdown, and potential layoffs. Based on improving trends in the second half of calendar year 2013, CHPRC is addressing these issues. CHPRC subcontractor injury rates decreased significantly, primarily due to the completion of ARRA work. Much of the construction-related work previously performed by subcontractors is now self-performed by CHPRC.

In September 2013, RL identified two cases that were not recorded per title 29, Code of Federal Regulations, part 1904 (29 CFR 1904); a significant improvement since 2011 when 21 cases were disputed. Based on the periodic reviews by RL, discussions with RL subject matter experts (SME), and the Team's review of accident and injury logs, CHPRC is appropriately reporting and managing occupational accidents and injuries and meets the expectations for participation in DOE-VPP at the Star level.

III. MANAGEMENT LEADERSHIP

Management leadership is a key element of obtaining and sustaining an effective safety culture. The contractor must demonstrate senior-level management commitment to occupational safety and health, in general, and to meeting the requirements of DOE-VPP. Management systems for comprehensive planning must address health and safety requirements and initiatives. As with any other management system, authority and responsibility for employee health and safety must be integrated with the management system of the organization and must involve employees at all levels of the organization. Elements of that management system must include: (1) clearly communicated policies and goals; (2) clear definition and appropriate assignment of responsibility and authority; (3) adequate resources; (4) accountability for both managers and workers; and (5) managers must be visible, accessible, and credible to employees.

In 2011, the Team determined that CHPRC managers had dealt effectively with some of the challenges they faced in the wake of the 2008 transition, but other more difficult challenges remained. CHPRC was having difficulty ensuring that corrective actions in response to external issues were effective; that manager presence and interface with workers promoted the CHPRC goal of production through safety; and implementing effective, critical, integrated self-assessments.

Since 2011, CHPRC managers have faced some new challenges that threatened to erode their efforts to improve communication and earn workers' trust. RL asked CHPRC to lead negotiations between HAMTC and the other Hanford site contractors. In September 2011, funding under ARRA ran out, necessitating workforce reductions. Changes in Federal funding levels since 2011 have caused additional layoffs and uncertainty. The ongoing contract negotiations finally concluded in October 2013, although some workers are still dissatisfied with some concessions, particularly regarding overtime and work assignment provisions.

CHPRC management systems and processes that define roles, responsibilities, and authorities for safety and health remain in place. The CHPRC policy PRC-POL-SH-5053, *Safety, Health, Security, Quality, and Environmental Policy*, continues to apply to all CHPRC and CHPRC subcontractors performing CHPRC work. That document establishes the CHPRC policy as:

CH2M HILL Plateau Remediation Company's philosophy is: "If we can't do it safely, we won't do it." Protection of people and the environment, while delivering quality products and services is a CH2M HILL Plateau Remediation Company core value. It is our vision to create a unified "One Culture. One Team." relationship that empowers managers, employees, and contractors to drive this philosophy and core value into all operations and achieve excellence in safety, health, security, quality, and environmental performance. This is accomplished through the use of the Integrated Safety Management System (ISMS), Environment Management System (EMS), Human Performance Improvement initiative, and by implementing the basic tenets of the Voluntary Protection Program (VPP).

The CHPRC *Integrated Safety Management System (ISMS)/Environment Management System (EMS) Description*, PRC-MP-MS-003, describes how environment, safety, health, and

quality are integrated into the work planning and execution for the Plateau Remediation Contract scope of work. RL initially reviewed ISMS in February 2010 and provided contingent approval of corrective actions identified during that review. Since 2011, CHPRC completed those corrective actions, and discussions between the Team and RL did not identify any continuing issues or concerns with the overall CHPRC ISMS implementation.

CHPRC has a worker safety and health program, PRC-MP-SH-32219, *10 CFR 851, CHPRC Worker Safety and Health Program Description*, that adequately describes how CHPRC implements 10 CFR 851, *Worker Safety and Health Program*.

CHPRC continues to use two management processes for review of high hazard work. First, each project within the Plateau Remediation Contract has a Hazard Review Board (HRB). The HRB reviews: (1) select work activities, particularly complex, high-hazard tasks; (2) safety measures implemented to support the work; and (3) personnel overseeing the work activities to ensure they understand the work activity, the identified hazards, and the respective controls for those hazards. The HRB consists of managers, supervisors, HAMTC Safety Representatives and workers within the project. CHPRC uses the HRB as a management check to ensure the project is ready for field implementation with basic hazard identification and mitigation strategies integrated into work practices and methods. There are clearly defined criteria for when the HRB must review work. The second process is the Executive Safety Review Board (ESRB), chartered to oversee and monitor the effectiveness of programs and processes associated with Safety Management Programs, Quality Assurance Program, ISMS/EMS implementation activities, and the Price-Anderson Amendments Act program. ESRB membership consists of the President, Vice President/Chief Operating Officer, each of the project area vice-presidents, and the senior manager for each business unit. The Team had the opportunity to attend an ESRB meeting that reviewed the root cause analysis for a near-miss event involving a Strontium-90 source in September 2013. The members of the ESRB included project vice-presidents, appropriate SMEs, and other leaders. The members asked very pointed and pertinent questions and used the meeting to identify additional causes and corrective actions.

Since 2011, the CHPRC management team has become significantly more effective in communicating its goal of production through safety. Although in 2011 CHPRC expected senior managers to spend at least 25 percent of their time and mid-and lower-level managers to spend at least 50 percent of their time in the field, few managers were meeting that expectation. In the past year, the new CHPRC President has reiterated and held managers accountable for meeting that expectation, and effectively lead by example. In addition to reestablishing that expectation, he provided managers with other expectations to meet during that time. For example, he asked all managers to meet with small groups of workers and ask the workers "What's bugging you?" Managers created and maintained lists of these individual concerns. In particular, the Company President expects managers to identify and correct those issues and concerns that do not make sense or interfere with efficiently accomplishing the mission.

In 2011, CHPRC faced challenges coordinating and obtaining qualified personnel support from Mission Support Alliance, LLC (MSA). To address those challenges, CHPRC and MSA now meet on a regular basis to identify long-term project needs and priorities. In addition, CHPRC now self-performs some tasks previously performed by MSA. During this assessment, CHPRC managers did not identify any issues to the Team related to MSA personnel assignments.

CHPRC continues to provide resources for employee recognition and rewards, including resources from fee where DOE does not provide funding. CHPRC splits these resources between project directors on a per-employee basis for use by managers, supervisors, and safety committees. Although managers have the resources for reward and recognition, a continuing theme during worker interviews was that those rewards and recognition are either not used or are not very effective. For example, the Company President established a goal that if the entire company can complete 1 million hours without a recordable injury, the managers would prepare a steak and lobster meal for the workers. Normally, the Team discourages companies from linking any reward and recognition directly to accident or injury rates because the reward might discourage some workers from reporting injuries or accidents. In this case, the reward is not effective because most workers interviewed by the Team do not believe it is a realistic or achievable goal. Most importantly, workers repeatedly stated they did not care about the reward, and would continue reporting any injury no matter how minor. CHPRC should encourage managers to reward and recognize workers for effectively contributing to working safely and ensure those rewards are meaningful to workers for reasons other than the cash value of the award.

Opportunity for Improvement: CHPRC should encourage managers to reward and recognize workers for effectively contributing to working safely, and ensure those rewards are meaningful to workers for reasons other than the cash value of the award.

RL continues to establish annual Performance Objectives, Measures, and Commitments (POMC) tied directly to TRC and DART case rates. While both DOE and the Occupational Safety and Health Administration VPP use TRC and DART case rates as the comparison statistic across industries, the use of that statistic in connection with the contract award fee can be construed as a negative reinforcement. In 2011, RL identified potential underreporting of injuries, and the Team identified that some workers were hesitant to report injuries. During the current assessment, as previously stated, workers interviewed by the Team were clearly willing to report all injuries, and they paid little attention to company goals for TRC and DART rates. The POMC goals were not visible or publicized to the workers. While CHPRC managers have shielded workers from TRC and DART rate goals, CHPRC should continue to work with RL to replace POMC goals related to TRC and DART case rates with positive incentives directly linked to contractor actions that will prevent accidents and injuries

Opportunity for Improvement: CHPRC should continue to work with RL to replace POMC goals related to TRC and DART case rates with positive incentives directly linked to contractor actions that will prevent accidents and injuries.

In 2011, the Team noted some employees had concerns related to safety and health personnel assigned to the project organization with only a dotted line relationship to the central safety and health organization. Since then, CHPRC has reorganized, collecting all safety, health, and radiological control personnel, into a central organization. Personnel have a dotted line relationship to the projects they support. The result is a more cohesive and consistent approach to safety and health. CHPRC physically moved the central safety and health organization from its offices in Richland out to the site. This move allows safety expertise to respond quickly to

field concerns, work planning walkdowns, and gives safety and health personnel a better understanding of site activities and conditions and a better relationship with project personnel.

CHPRC has improved its self-assessments since 2011. The annual self-assessment process includes a systematic review of all projects and areas, including critical evaluation of each of the tenets of DOE-VPP. RL managers identified that CHPRC has been more effective in self-identifying issues. For example, during this assessment CHPRC identified a trend in conduct of operations at the PFP Deactivation and Decommissioning (D&D) project. While there had not been any reportable occurrences related to the trend, CHPRC decided to conduct a half-day safety pause to clarify expectations, listen to workers' concerns and suggestions, and reverse the trend.

As part of its self-assessments, CHPRC conducted a Safety Conscious Work Environment (SCWE) survey and identified issues related to leadership. In response, CHPRC initiated a Leadership Impact Initiative. This initiative focuses on core leadership principles and skill development to enhance managers' skills and effectively engage with the workforce. The initiative consists of a 2-day training and workshop session that combines 20-25 managers from all levels across CHPRC. CHPRC completed several sessions in 2013 and plans monthly sessions through 2014 until all managers have completed the training. CHPRC supplements the workshops with quarterly manager meetings, quarterly executive manager retreats, and quarterly meetings with frontline supervisors. Workshop participants already demonstrate improved skills and abilities, and the initiative shows great promise for further improvement.

CHPRC altered its communication efforts in 2013. Previously, CHPRC directed the communication program at external communications, trying to manage the company image and keep events from being misinterpreted. In 2013, CHPRC decided to refocus its efforts to improve communication to the workers and spend less effort trying to spin the external message. CHPRC now spends approximately 70 percent of its communication efforts maintaining newsletters, Web pages, and coaching managers. Each project has a communications staff person assigned to assist the associated management team, review messages to employees, and ensure managers' statements and actions do not unintentionally conflict with the overall CHPRC messages.

CHPRC managers' primary obstacle at this point is building trust with the workforce. In the wake of prolonged contract negotiations with HAMTC, employees heard many different opinions and rumors and saw many actions that detracted from their trust of managers. Over the past several months, the senior management team has been working closely with the Employee Zero Accident Councils (EZAC), the HAMTC Safety Representatives, middle managers, and supervisors to improve trust and help workers regain their willingness to report problems and identify solutions. During employee interviews, several workers expressed concerns for fear of retaliation. Primarily, they were concerned that if they raised a safety issue, managers might target their first line supervisors for layoffs. The workers liked and trusted their first line supervisors and worried about putting the supervisor in jeopardy. Workers also expressed concerns that project plans might include unsafe or risky practices. Workers often attributed these fears to one or two people. In those cases, workers did not recognize, and CHPRC has not effectively communicated, that no single person has the authority to make the decisions workers were concerned about. The gap between rumor and reality and its contribution to distrust became very evident to managers during the aforementioned safety stand-down at PFP.

Managers were surprised to find out that workers were unaware of specific project milestones or approaches.

Managers already have multiple methods available to them to improve trust and communication. For example, the HAMTC Safety Representatives have always been an effective conduit between managers and workers. Since CHPRC expects managers to spend a large portion of time with the workforce, managers should regularly spend some of that time with the HAMTC Safety Representatives. Regularly attending prejob briefs and visiting jobsites in conjunction with the HAMTC Safety Representatives will afford them the opportunity to hear problems and ideas directly from workers and will demonstrate managers' trust in the HAMTC Safety Representatives. Managers should also continue or expand their efforts to meet with small groups of workers, asking them "What bugs you?" Finally, managers should ensure workers are apprised of, and involved with, setting project milestones, identifying solutions to technical issues, and given the opportunity to regularly voice their concerns in a safe, nonthreatening forum.

Opportunity for Improvement: CHPRC managers should regularly schedule field visits in combination with the HAMTC Safety Representatives.

Opportunity for Improvement: CHPRC managers should continue or expand their efforts to meet with small groups of workers, asking them "What bugs you?"

Opportunity for Improvement: CHPRC managers should ensure workers are apprised of, and involved with, setting project milestones, identifying solutions to technical issues, and given the opportunity to regularly voice their concerns in a safe, nonthreatening forum.

CHPRC expects its subcontractors to meet the same safety and health expectations as its own workers. To improve the flow down of safety and health requirements to subcontractors, CHPRC safety professionals worked with the buyer technical representatives and contract specialists to inform subcontractors of safety and health requirements at the various stages of the contract. Additionally, CHPRC may meet with potential subcontractors to ensure they understand the expectations for health and safety. CHPRC meets quarterly with its subcontractors to review safety performance, address any issues, and ensure continued effective safety programs.

Conclusion

CHPRC has significantly improved its Management Leadership. Managers are more visible in the workplace, although many workers would like to see more manager presence. Efforts to train and coach managers at all levels are demonstrating effectiveness. Schedule pressures evident during the 2011 review have been removed, and managers consistently echoed the belief that stopping work when questions or concerns arose was essential to long-term success. CHPRC demonstrates the Management Leadership expected of a DOE-VPP Star participant.

IV. EMPLOYEE INVOLVEMENT

Employees at all levels must continue to be involved in the structure and operation of the safety and health program and in decisions that affect employee health and safety. Employee involvement is a major pillar of a strong safety culture. Employee participation is in addition to the individual right to notify appropriate managers of hazardous conditions and practices. Managers and employees must work together to establish an environment of trust where employees understand that their participation adds value, is crucial, and welcome. Managers must be proactive in recognizing, encouraging, facilitating, and rewarding workers for their participation and contributions. Both employees and managers must communicate effectively and collaboratively participate in open forums to discuss continuing improvements, recognize and resolve issues, and learn from their experiences.

In 2011, the Team concluded that CHPRC had numerous ways to permit and encourage worker involvement in the safety and health program. CHPRC supported worker initiatives with company funds where DOE could not. In a few cases, workers were not effectively using those means for a variety of reasons, including distrust of their managers and supervisors, or fear of retaliation, and some workers did not understand their rights under 10 CFR 851. Managers were adamant about their desire to promote worker participation, provide feedback, and stop work when necessary, but needed to actively seek and reach out to those workers that felt disenfranchised and address their concerns.

Over the past 3 years, CHPRC has continued its support for workers to attend various safety conferences and activities (Voluntary Protection Programs Participants' Association (VPPPA) conferences, Hanford Safety Exposition, and the DOE Integrated Safety Management conference)). As in 2011, CHPRC extends these opportunities beyond committee members to workers that want to attend, with conference attendees selected by random drawing from a pool of interested participants. In addition, CHPRC encourages workers to prepare and present relevant safety topics at those conferences.

CHPRC still uses the employee involvement tools found during the 2011 review, such as the EZAC, the President's Zero Accident Council (PZAC), and other Hanford site-wide committees. Site-wide committees include, but are not limited to, electrical safety, hoisting and rigging, respiratory protection, confined space, lockout/tagout, and fall protection. Collectively, these committees continue to provide a forum for workers and managers to discuss issues and concerns, propose new ideas and approaches, and jointly promote a culture of continuous improvement and safety excellence. The Team attended several EZAC meetings that demonstrated active employee involvement. Most employees contacted by the Team are actively engaged to improve safety in their workspaces. CHPRC's efforts to improve middle manager support and make safety councils representative of all work areas are successful.

Most CHPRC employees are engaged in work planning evolutions, hazard analysis processes, worksite inspections, and postjob evaluations. CHPRC employees have the ability to voice their suggestions and concerns through several mechanisms. These mechanisms include raising concerns directly to their supervisors, enter anonymous concerns into the safety logbook, utilize CHPRC employee concerns program, DOE employee concerns program, or enter their concern into the dissenting professional opinion process to resolve issues. Employees also participate in accident investigations and incident critiques.

CHPRC continues its efforts to improve communication with its workers. The Communications Directorate is helping to improve the quality and clarity of publications for workers and coaching managers. The Leadership Impact Initiative (see Management Leadership) also contributes to this effort. The Team observed several examples of improving communication. For example, EZAC meeting attendees openly shared ideas, as well as concerns. The Team observed a senior manager providing information on the budget process and its effects on the workers to help alleviate continuing workers' fears by reassuring workers that an involuntary reduction in force was no longer a consideration for their project. EZAC discussions also included presentations from the PZAC with the expectation that EZAC attendees would share that information with their individual workgroups. In addition, CHPRC makes all PZAC and EZAC meeting minutes available to all employees.

The HAMTC Safety Representative program continues to provide an effective conduit for all employees to voice their concerns. Safety Representatives are normally present in the workspaces, attend prejob briefings, conduct regular walkdowns of the site, and meet frequently with the project vice presidents, Company Vice President and Chief Operating Officer, and the Company President. They also attend EZAC meetings on a regular basis. HAMTC Safety Representatives receive training in accident investigation techniques. The new collective bargain agreement established a contractual requirement for HAMTC Safety Representative participation in accident or incident critiques involving bargaining unit personnel. Their involvement is encouraged to help workers feel comfortable in critiques and help ensure workers are treated fairly and justly during the critique process, as well as provide the worker perspective in root cause analysis and subsequent corrective actions. HAMTC Safety Representatives are an effective element in all aspects of the CHPRC safety program.

Some CHPRC projects continue to use safety logbooks and safety issues and ideas as a means for employees to identify and resolve safety issues. PRC-CHRT-SH-9982, *Presidents' and Employees Zero Accident Councils*, requires the EZAC chairperson or designee to maintain the logbook. If an issue cannot be resolved within 60 days, the issue is elevated to the Condition Reporting and Resolution System (CRRS). Periodically, a discussion of open safety log items occurs at a PZAC meeting for senior manager's attention.

While the logbooks provide a convenient way for employees to raise issues, the projects may not always address those issues in a timely manner. In other cases, workers raise issues in the safety logbook that other mechanisms should have identified and fixed, but no followup occurs to determine why the issue was not addressed before it was entered in the safety logbook. For example, operators conduct weekly fire loading inspections at PFP. For 2 weeks in a row, operators identified fire loading as an issue on the round sheets, but no corrective actions occurred. An operator finally entered the issue in the safety logbook, and corrective actions occurred the next day. In another example, workers identified an issue with loose carpeting in a trailer that created a tripping hazard and entered that issue in the safety logbook. That issue remained open until an individual tripped and fell on the loose carpeting. CHPRC should ensure managers increase their attention to logbooks, round sheets, and safety logbooks, and immediately mitigate the condition until they can implement permanent solutions.

Opportunity for Improvement: CHPRC should ensure managers increase their attention to all forms of hazard identification, including logbooks, round sheets, and safety logbooks, and immediately mitigate the condition until they can implement permanent solutions.

Most of the workers interviewed by the Team stated that they have opportunities to participate in safety committees (PZAC, EZAC, and VPP). Most employees were comfortable voicing opinions or suggestions during EZAC meetings and identifying and correcting safety concerns. EZAC members shared observations about home safety, traveling, and working condition lessons learned. The majority of employees interviewed were knowledgeable about hazards in their workplace and the controls that protect them from those hazards, and were knowledgeable about the requirement to report all injuries, no matter the severity.

All interviewed workers were knowledgeable about the CHPRC expectation to stop work if they encountered a safety issue. During the safety pause at PFP, a manager thanked workers for stopping a job when they identified an unanalyzed hazard in their work package. Workers assigned to demolish a wall recognized that the wall contained an energized electrical conduit. The manager publicly thanked the workgroup for stopping a job that could have resulted in injuries to the workers.

Despite efforts to improve communications with the workforce, PFP managers continue to have trouble in communicating project, safety, and lessons learned information to the workers. This issue was particularly evident during the safety pause at PFP. Managers held the safety pause in response to several recent events that indicated a need to refocus on procedural or work document adherence. During the safety pause, workers posed questions to managers that revealed the lack of communication. For example, one worker asked why they had not received any information prior to this meeting about these events. The worker commented to senior managers that this was the first time they heard this information. He asked why the Lessons Learned Program was not forwarding this information to the workgroups so they could address them during their prejob briefings.

Difficulty in communications was also evident in workers' concerns about procedure use, particularly with regard to "continuous use" versus "reference" work instructions. One worker expressed her frustration that "continuous use" procedures contained statements in some sections that permitted workers to perform steps in any order. Her understanding was that "continuous use" meant step-by-step adherence. In fact, the DOE *Writer's Guide for Technical Procedures*, DOE-STD-1029-92, and *CH2M HILL Plateau Remediation Company Procedures*, PRC-PRO-MS-589, allow continuous use procedures to have sections, appropriately identified, where workers may perform steps in any order when the order of steps is not critical to the procedure's outcome. Managers must ensure that the workforce is aware of the correct requirements and expectations regarding procedure use to ease workers' concerns while continuing to stress the need to follow the procedure or stop work. CHPRC should establish a regular and frequent mechanism at PFP, similar to the forum used for the safety pause, for managers to communicate directly with the workers. This mechanism should discuss success stories, recognize worker input, provide status of milestones, highlight recent changes, identify impediments to performing work, control rumors, identify management concerns, and discuss other items important to the workers.

Opportunity for Improvement: CHPRC should establish a regular and frequent mechanism at PFP for managers to communicate directly with the workers, discuss success stories, recognize worker input, provide status of milestones, highlight recent changes, identify impediments to performing work, control rumors, identify management concerns, and discuss other items important to the workers.

PFP managers could increase worker involvement and ownership of work documents and improve worker involvement in the preparation of work instructions. Some workers expressed their concern during the safety pause that managers hold them accountable for poor work instructions and misinterpreting instructions in the work document when they had little involvement in the development of those instructions. During the safety pause, senior managers reiterated the CHPRC expectation that if workers cannot follow the procedure, they should stop work and get the procedure fixed. CHPRC work planning instructions expect worker involvement in the work planning process, but planners and supervisors sometimes limit that involvement to reviewing the procedure prior to the start of work in the interest of expediency. CHPRC should increase worker participation early in the procedure definition and development process to improve worker ownership and understanding of the final work instructions.

Opportunity for Improvement: CHPRC should increase worker participation early in the procedure definition and development process to improve worker ownership and understanding of the final work instructions.

CONCLUSION

Employee Involvement is evident across most of the CHPRC projects. The PZAC and EZACs function as effective conduits for raising and addressing safety concerns. Most employees engage and contribute to safety and process improvements by offering suggestions and ideas captured in safety logbooks, communications with supervisors, and interaction with HAMTC Safety Representatives. However, a segment of the worker population believes managers are not effectively communicating company and project expectations. CHPRC is taking positive steps to reach out to that segment, build trust, and encourage them to become part of the solution and contribute to project success. CHPRC demonstrates the Employee Involvement expected of a DOE-VPP Star participant.

V. WORKSITE ANALYSIS

Management of health and safety programs must begin with a thorough understanding of all hazards that might be encountered during the course of work and the ability to recognize and correct new hazards. There must be a systematic approach to identifying and analyzing all hazards encountered during the course of work, and the results of the analysis must be used in subsequent work planning efforts. Effective safety programs also integrate feedback from workers regarding additional hazards that are encountered and include a system to ensure that new or newly recognized hazards are properly addressed. Successful worksite analysis also involves implementing preventive and/or mitigating measures during work planning to anticipate and minimize the impact of such hazards.

In 2011, the Team concluded that CHPRC had established programs for developing work packages and performing work, and CHPRC could benefit by ensuring that the implementation of improved worksite analysis procedural changes captured and institutionalized the logic for control selection. In addition, CHPRC needed to take advantage of workers' input and concerns for hazardous energy controls to reduce the potential for inadvertent releases of hazardous energy.

Since 2011, CHPRC centralized the work planning and hazard analysis process into the Project Technical Services organization. In 2013, CHPRC also centralized the Operations Program, and several of the Safety Management Programs, to strengthen the existing work control process and increase operational efficiency. In addition, CHPRC reduced the use of preselected subcontractors for construction and staff augmentation support, and now self-performs these functions. Continuous improvement activities planned for the organization in fiscal year 2014 include initiatives, such as using a multi-function team (including the HAMTC Safety Representatives), to simplify and streamline the work control process (via a value engineering study), a strategic plan for improving conduct of operations, and a focused effort to simplify company-level procedures.

Two procedures primarily drive the hazards analysis process. *Work Management*, PRC-PRO-WKM-12115, defines roles, responsibilities, and processes used to implement the CHPRC work management process to plan and perform work. *Job Hazard Analysis*, PRC-PRO-WKM-079, defines roles, responsibilities, and processes used to identify, evaluate, control, and communicate potential hazards and environmental impacts relative to discrete work activities or tasks. In particular, PRC-PRO-WKM-079 implements and integrates use of the General Industrial Hazard Analysis (GHA), the Craft-Specific Job Hazard Analysis (CHA), and the Worksite Hazard Analysis (WHA). The GHA addresses hazards that CHPRC expects all employees to recognize and mitigate, based on the fundamental knowledge and training requirements of his or her job assignment. The CHA addresses the hazards craft personnel may encounter while performing work within their discipline. CHPRC then uses the WHA to review the current work environment, identify changes, and confirm the initial skill-based decision prior to the start of the fieldwork/activity. CHPRC uses the Web-based Automated Job Hazard Analysis (AJHA) in the work planning process for performing initial hazard identification, hazard analysis, and AJHA planning sessions.

In 2013, CHPRC revised PRC-PRO-WKM-079 to include a change to the job hazard analysis process. The revision added the following procedure requirements:

“Performance of an automated job hazard analysis (AJHA) is not required when the only skill-based criterion not satisfied is radiological. This work is still considered “beyond skill-based” however; the responsible management/technical authority may determine that performance of the AJHA is not necessary. “

“...for work packages, select “AMW Only” (ALARA Management Worksheet) in the JCS AJHA review field AND sign for approval...”

In order for work to be designated as skill-based, it must be performed within the hazards and controls boundaries identified in the GHA, CHA, Employee Job Task Analysis (EJTA), and the Integrated Training Electronic Matrix (ITEM). Several work packages demonstrated that CHPRC is using the skill-based category, including the AMW exception, appropriately to efficiently plan and perform work. GHAs and CHAs appropriately analyzed the scope of general and craft hazards.

Included within the skill-based criteria is the determination that the proposed activity is a repetitive activity/task where the performers have demonstrated proficiency and the same type of hazards will be present. Although CHPRC uses the “repetitive” determination frequently in skill-based work, CHPRC does not identify or capture the basis for that determination within the job control system (JCS). In order to improve the reliability of the repetitive work determination and ensure subsequent work does not exceed the scope of that determination, CHPRC should document the basis for determining that work is repetitive within the JCS and ensure assumptions regarding worker proficiency, scope of work, existing hazards, and controls remain consistent with that original determination.

Opportunity for Improvement: CHPRC should document the basis for determining that work is repetitive within the JCS, and ensure assumptions regarding worker proficiency, scope of work, existing hazards, and controls remain consistent with that original determination.

A fundamental expectation of VPP is that workers are involved in the work planning and hazard analysis and controls process. PRC-PRO-WKM-079 requires workers to be involved in the jobsite walkdown and be part of the AJHA Team. Similarly, PRC-PRO-WKM-12115 requires the Work Planning Team to include workers in the work activity planning; however, in Appendix D to PRC-PRO-WKM-12115, the listing of specific planning team requirements does not require participation of the workers in the work planning process. Workers stated that their participation in the work planning process, including the hazards analysis and controls process, was inconsistent and several stated they were not involved in the work planning/hazards analysis and controls process. The Team found workers present during work planning meetings and AJHA walkdowns. CHPRC should revise PRC-PRO-WKM-12115 to require worker participation on the Work Planning Team and involvement in the hazards analysis and controls process, and ensure participation of workers.

Opportunity for Improvement: CHPRC should revise PRC-PRO-WKM-12115 to require worker participation on the Work Planning Team and involvement in the hazards analysis and controls process, and ensure participation of workers.

Work packages reviewed by the Team included baseline hazard inventories documented in accordance with *Industrial Hygiene Exposure Assessments*, PRC-PRO-SH-17916. The industrial hygiene exposure assessment (IHEA) process is sound and evaluates the relative risk of the hazard and the priority of controls. In one case, work package number 2Z-11-02342/M, *Route Breathing Air Hoses from Room 250 to Room 232*, did not include an IHEA for lead paint, although the package identified lead paint as a hazard since the wall surface was disturbed. To preclude missing other hazard evaluations, CHPRC should evaluate a broader sample of active work packages to confirm the completion of IHEAs when required.

Opportunity for Improvement: CHPRC should evaluate a broader sample of active work packages to confirm the completion of IHEAs when required.

CHPRC reports and analyzes incidents per the Occurrence Reporting and Processing System (ORPS). As part of the 2011 VPP review, there were a number of hazardous energy control issues identified. In 2013, CHPRC reported to DOE a recurring “R” event, *Collective Significance-Hazardous Energy Control Events*, EM-RL-CPRC-GENLAREAS-20130002. Between June 2012 and August 2013, CHPRC experienced 17 individual reportable occurrences related to hazardous energy control (HEC). These 17 events occurred across CHPRC, at locations such as 100 K-West area and the Cold Vacuum Drying Facility, and included a variety of issues, such as work being performed with an inadequate hazard review, or voltage discovered during safe condition check. CHPRC initiated compensatory actions and performed a root cause analysis to address the collective significance of the 17 events and determine the need for additional corrective actions to address a potentially larger programmatic issue. The analysis found the root cause was that CHPRC had not provided adequate focus and rigor during the planning phase of the HEC process and that there was an over reliance on decisionmaking while executing the HEC process in the field. CHPRC identified several corrective actions, including the establishment of a process to ensure expectations and demonstrated performance of appropriate HECs (including appropriate conduct of operations protocols), assessments, additional tracking and trending of errors occurring as part of the HEC process. Although there have been four follow-on, HEC-related events (since filing of the “R” report), CHPRC is reevaluating and realigning, if necessary, its compensatory actions, and long-term corrective actions related to HEC. CHPRC continues to focus on improvement to its Conduct of Operations program, including defining, communicating, and enforcing clear, well-defined, and understood management expectations to stop work.

CHPRC tracks, trends, and evaluates TRC and DART rates, and first-aid case rates. However, CHPRC does not collectively track, trend, and evaluate other safety and health inspections and program reviews. For example, each project and group conducts periodic safety and health inspections, but does not share results of those inspections with all projects. The Occupational Safety and Industrial Hygiene Director has been working to establish a centralized database for these inspection results, but as of this assessment, it was not active. The safety and health inspections could provide information on deficiencies or improvements occurring across the site. CHPRC should develop a more systematic method to collectively track, trend, and evaluate data from the Safety and Health Inspection Program to identify potential programmatic issues and corrective actions.

Opportunity for Improvement: CHPRC should develop a more systematic method to collectively evaluate, track, and trend data from the Safety and Health Inspection Program to identify potential programmatic issues and corrective actions.

Conclusion

CHPRC has established programs for analyzing hazards during the work planning process. CHPRC can benefit by improved worksite analysis procedural changes that document and institutionalize the hazards analysis. CHPRC can further strengthen worker involvement in the hazard analysis process. CHPRC has demonstrated the excellence in Worksite Analysis expected of a DOE-VPP Star site.

VI. HAZARD PREVENTION AND CONTROL

Once hazards have been identified and analyzed, they must be eliminated (by substitution or changing work methods) or addressed by the implementation of effective controls (engineered controls, administrative controls, or personal protective equipment (PPE)). Equipment maintenance processes to ensure compliance with requirements and emergency preparedness must also be implemented where necessary. Safety rules and work procedures must be developed, communicated, and understood by supervisors and employees. These rules/procedures must also be followed by everyone in the workplace to prevent mishaps or control their frequency/severity.

CHPRC effectively uses elimination, substitution, and engineering controls throughout the projects areas. For example, CHPRC uses Plexiglas for many applications since it does not absorb water. Applications include jigs and sign holders. For instance, at S&GRP, a Plexiglas jig was constructed to help connect a heavy hose from a water storage tank to a fixed inlet pipe on a tank truck. The jig supports the heavy hose during connect and disconnect and provides an easily cleaned nonporous surface to capture and contain any radioactive water spills during disconnect. The jig also allows the heavy flex pipe to rest evenly with the inlet pipe so workers do not have to struggle when connecting and disconnecting the pipes. The jig is an improvement to reduce the potential exposure to a radioactive water hazard.

To assemble these applications, carpenters must glue the pieces of Plexiglas together. The glue contained methylene chloride, a known carcinogen that required extensive controls. The carpenters identified an alternative, called Dymax®, an ultraviolet light-cured glue formulated for use on Plexiglas. By using the Dymax® system, CHPRC eliminated the methylene chloride adhesive. An extra benefit is that the curing time for assembled parts was reduced from hours to a few minutes, making the carpenters more productive while improving safety.

CHPRC also implemented engineered controls that significantly reduce heat stress at PFP. During the D&D of the PFP building in 2009, D&D crews encountered heat stress conditions inside the building. The necessary heat stress controls disrupted work, and the situation grew worse during the summer months. The original building ventilation did not offer enough cooling for crews wearing anticontamination clothing (Anti-Cs) and respirators. After considering several options, CHPRC received funding to upgrade the existing ventilation system near building 234-5Z. Some of the new equipment included external chiller skids, air handling units, and updated alarms and control systems. CHPRC completed installation and testing of the system in July 2010 and the system provided immediate positive results. It provided adequate cooling to buildings 234-5Z, 242-Z, and 236-Z, reducing the need for extensive heat stress controls. The total cost of the project was slightly less than \$4 million, with continued payback in avoidance of impacts to the schedule from heat-related work stoppages.

Since the VPP review in 2011, a number of improvements have been made to the hazards analysis and control process associated with radiological protection. These improvements include performing hazards analysis based on unmitigated radiological hazards, a new procedure for radiological surveys of industrial equipment, and improved training pertaining to containment/confinement systems. Several Radiological Work Permits (RWP) used at PFP were evaluated for hazard identification and control selection. The Team found the RWPs identified the radiological hazards and controls.

Also at the PFP building, a high radiological hazard exists in one section of the building, known as the McCluskey room. In 1976, Harold McCluskey received the largest dose of Americium 241 ever recorded when a resin bed exploded and left the room highly contaminated. The room was sealed and no one had entered the room until 2006. As part of the planning for the D&D of this room, workers, supervisors, managers, and safety and health professionals have teamed together to develop controls and apply best practices. The team contacted their counterparts at the Idaho Cleanup Project and visited the Idaho site to discuss lessons learned that can be applied to the PFP project. From this effort, the team learned about the Mine Safety Appliance Company PremAire® airline supply system that has advantages over their current airline supply system. Primarily, the PremAire® system provides adjustable cooling for the worker that can provide air that is up to 60 degrees cooler. The CHPRC team is also engaged in mockup preparations, training development, and other activities to prepare the facility and workers for the arrival of the new respirator equipment. The new PremAire® system will reduce heat stress issues and improve working conditions within the highly contaminated room.

CHPRC uses powered air purifying respirators (PAPR) to control radiological exposures to workers in areas where supplied air respirators are not required. Two years ago, workers encountered several problems with the PAPRs that had the potential to expose them to airborne radioactive particulate contamination. CHPRC listened to the worker complaints and worked with both workers and the manufacturer to improve the PAPR. For example, the on/off switch on the PAPR could be turned off when a worker rubbed the PAPR against an object. CHPRC designed and installed a switch guard, approved by the manufacturer, which protected the switch from an accidental shutoff. Another issue CHPRC solved was the accidental disconnect of a plug to the motherboard, which shut off the PAPR. The PAPR is worn on the back of workers, and when a worker presses the PAPR against an obstacle, the plug and motherboard are subjected to pressure and bending. Based on CHPRC feedback, the manufacturer developed an adhesive supplement to secure the two connections even during rough handling.

CHPRC continues to improve the use of PAPRs by the workers. Based on assembly issues from the past, CHPRC implemented the 4H program to encourage workers to peer-check other PAPRs prior to entry and periodically during the work evolution. Workers focus on the connection of the hose, the hood, the housing, and the high efficiency particulate air (HEPA) (or other) cartridges. Once the peer check is completed, a worker attaches a “4H” sticker to the PAPR hood. The efforts CHPRC made to continually to improve the respiratory protection program earned CHPRC the 2013 Innovation Award from VPPPA.

Workers are knowledgeable of their responsibility to stop work if they see or think they are in an unsafe operation. The stop work procedure is described in DOE-0343, *Hanford Site Stop Work Procedure, Rev. 3*. Workers interviewed by the Team indicated they were comfortable using the stop work procedures; and, in fact, several workers stated they had stopped work in the past. They also indicated that they could voice their concerns at any time through multiple mechanisms (see discussion in Employee Involvement), and that CHPRC emphasized SCWE.

CHPRC has experienced and knowledgeable safety and health professionals. The personnel have the expertise to accomplish a variety of activities, including training, policy, and standards development; radiological control coordination; injury and illness record keeping; and are very involved with supporting the work activities in the field. According to a senior safety professional, CHPRC has approved the hiring of two additional senior safety and health positions

to add professional experience and knowledge depth. During this assessment, the readiness and availability of safety and health professional to support work was demonstrated when an industrial hygienist responded to assess an unknown substance leaking along pipe threads within PFP. The field survey concluded it was a viscous substance previously known to be in the conduit. The Team observed that workers respected and trusted the safety and health professionals.

The Team observed other examples of workers identifying improved controls or work methods to reduce worker exposure to hazards. At the pump and treat facility in 200 East, workers were having a difficult time opening and closing a large valve. Workers were using a long, heavy bar (cheater bar) to operate the valve. To ease work and maintenance, workers and engineers modified the valve to include a gear reduced drive to provide the mechanical advantage necessary to operate the valve. In the same facility, condensate from equipment ended up in the path of doorways or walkways. Workers installed a conduit on the equipment and directed the condensate to floor drains, resulting in dry floors around the equipment and reducing concrete erosion. The buildings for some of the CHPRC projects are in a surveillance and maintenance operation. Workers inspect the buildings and repair maintenance issues like roof leaks, burnt bulbs, and broken floor tiles. CHPRC is keeping the smaller issues in check so they do not become large problems.

The 2011 assessment indicated that CHPRC had difficulty determining whether injured workers could or could not perform one or more of their primary duties from the EJTA, based on the work restrictions identified by the medical contractor. RL selected a new medical contractor, HPM Corporation (HPMC), for the Hanford occupational medicine support since the last report. The HPMC medical staff now link medical restrictions to duties listed on the EJTA for injured individuals, making it easier and clearer for CHPRC to correctly classify and report injuries and manage work restrictions. CHPRC case managers maintain a good working relationship with HPMC personnel on medical cases and other medical care issues, including regular case management meetings that provide a forum to discuss and clarify medical issues.

MSA maintains the overall site-wide emergency management program for the Hanford Site. Each contractor, such as CHPRC, implements DOE Order 151.1C within its emergency management program. CHPRC's program is defined in PRC-PRO-EM-7647, *Emergency Preparedness Program Requirements*. CHPRC develops and revises emergency planning hazard assessments (EPHA) for CHPRC areas/facilities. CHPRC maintains 18 EPHAs, 5 of which are currently undergoing review and comment. The Team reviewed HNF-SD-PRP-HA-002, *Plutonium Finishing Plant EPHA, Rev. 11*, dated September 27, 2010, and it identifies the numerous hazards associated with the PFP facility. Additionally, the Office of Safety and Emergency Management Evaluations (HS-45) evaluated severe natural phenomena at the Hanford Site in a report dated September 2013. That report identified three findings and three opportunities for improvement for CHPRC. CHPRC is tracking those issues in CRRS and is coordinating with RL to resolve the issues. In August 2013, the Hanford Site emergency management organization conducted the annual Hanford field exercise for DOE -RL. Overall, all 13 exercise objectives were rated as satisfactory with no findings, and the evaluators offered five suggestions for improvement. The CHPRC emergency management program is capable of managing and responding to the range of emergencies it may face.

Conclusion

CHPRC has successfully eliminated or reduced hazards by substitution, engineering controls, or PPE. They have introduced improvements with new technologies and lessons learned, and they listen to and allow workers to make improvements in controls to reduce hazards. CHPRC has worked to resolve medical restriction issues related to the EJTA. The continuous efforts to improve the control of work hazards, and improvements since 2011 meet the expectations for participation in DOE-VPP at the Star level for the Hazard Prevention and Control tenet.

VII. SAFETY AND HEALTH TRAINING

Managers, supervisors, and employees must know and understand the policies, rules, and procedures established to prevent exposure to hazards. Training for health and safety must ensure that responsibilities are understood, personnel recognize hazards they may encounter, and they are capable of acting in accordance with management expectations and approved procedures.

The 2011 assessment found CHPRC had a well-established training and qualification program that trained workers to recognize and control hazards. The CHPRC training program helps managers, supervisors, and employees understand the established safety and health policies, rules, and procedures to promote safe work practices and minimize exposure to hazards. The 2011 assessment identified some cases where workers' training to recognize changed or unexpected conditions had not been effective and needed to be addressed to achieve DOE-VPP Star status.

Three opportunities for improvement in 2011 stemmed from the inability of ITEM to generate delinquencies and delinquency rates, link Hanford General Employee Training (HGET) and CHPRC General Employee Training (CGET) to site access, and identify upcoming or expired training information. Since 2011, MSA replaced ITEM with the Enterprise Learning Management (ELM) system. ELM tracks employees training, schedules training, and rolls up training metrics for the training organization to manage. MSA maintains and manages the ELM system for the site, the Volpentest Hazardous Materials Management and Emergency Response Training Center (HAMMER), and coordinates with other site contractors to meet their training needs. Since ELM is relatively new to the Hanford Site, training coordinators are providing suggestions to MSA to improve ELM to meet their training and scheduling needs. CHPRC participates on a site-wide training committee established by MSA to evaluate suggestions and integrate improvements to meet the needs of site contractors.

Initial indications are that ELM effectively improves CHPRC's ability to manage employee training. Each day ELM produces a Web site report that shows projected training for the next 60 and 90-day periods. Each manager, at his or her convenience, can look in their section of the report to see when training is required or identify training delinquencies within their workgroup. This capability permits managers and supervisors to adjust job assignments within the workgroup for the day. Training coordinators stated ELM helps them manage qualifications that may lapse due to situations, such as the equipment out for repair, the equipment is no longer used, the equipment has been idle for several months, or other similar situations. With the ELM system, these lapses are not counted against the organization as delinquencies. During this assessment, ELM showed 1,276 scheduled training activities completed by CHPRC employees with 16 training no-shows for a monthly no-show rate of only 1.3 percent. CHPRC is continuing to work with MSA to identify additional improvements to ELM.

Administrative Procedure PRC-PRO-TQ-40164, *Personnel Training and Qualification*, continues to guide the CHPRC training process and ensure the workforce of approximately 1,400 employees are trained to work effectively and safely. The procedure addresses and defines responsibilities of managers, the Training Manager, training specialists, schedulers, employees, students, and instructors.

CHPRC develops an EJTA for each new employee. The EJTA defines physical and medical examination requirements, any medical baseline testing, and the employee's training requirements. After the employee satisfies the physical requirements, he or she meets with their supervisor to discuss specific training requirements. Every new employee receives HGET, CGET, ISMS training, EMS training, VPP training, universal waste management training, security training, and depending on job classification, specific training on beryllium, radiological hazards, ladder safety, and heat stress. Firstline supervisors and managers use the Hanford Site Worker Eligibility Tool (HSWET) to validate qualifications and training prior to assigning work to an employee. Examples of employee training and qualifications recorded in HSWET include respirator training qualifications, physicals, hazardous waste operations and emergency response (HAZWOPER) training, beryllium worker training, and radiological worker training.

MSA provides CHPRC employees training on site-wide programs, such as lockout/tagout, confined space entry, beryllium awareness, lead awareness, electrical safety, radiation worker, and HAZWOPER. CHPRC trainers provide facility-specific training. Examples of facility-specific training may include facility emergency response, facility-specific criticality requirements, documented safety analysis and technical safety requirements, or facility-specific equipment operation and limitations.

CHPRC developed an overarching improvement strategy to focus on leadership development across the management team (See Management Leadership). The development of this training was modeled from best practices used in other CH2M HILL projects and is being provided as training to firstline supervisors and managers at all levels. The training occurs at quarterly executive manager retreats, quarterly all-manager meetings and addresses team development and training skills, and other additional supervisory training tools. The training department estimates that so far approximately 75 people have attended these training sessions or workshops.

In addition to the Leadership Impact Initiative, CHPRC conducts fieldwork supervisor training on a quarterly basis. The team attended a fieldwork supervisor training class during this assessment. The content and focus of the class was on boosting worker accountability, and the presentation was informative and interactive. The subjects addressed included: company vision, standards, requirements, and ways to communicate goals, objectives, and priorities. Senior managers' involvement with the presentation provided management support and encouragement to the attendees.

CONCLUSION

Overall, CHPRC continues to maintain an effective training program that ensures trained and qualified workers can perform their job functions safely. The recent SCWE survey caused CHPRC to enhance frontline supervision skills by developing a Leadership Impact Initiative. This initiative focuses on core leadership principles and skill development. In addition, CHPRC provides quarterly fieldwork supervisor training to frontline supervisors to augment their development as managers. CHPRC meets the expectations of a DOE-VPP Star participant in the Safety and Health Training tenet.

VIII. CONCLUSIONS

Since 2011, CHPRC has made significant improvements in its safety programs. Despite many challenges and distractions related to collective bargaining negotiations and funding uncertainty, managers and workers have both sought improvements in management leadership and employee involvement. Some workers continue to be skeptical of managers, but managers are working to improve communication and trust. Improvements in work planning and control, increased manager visibility in the workplace, and continued efforts to more effectively involve workers and actively seek their opinions and ideas is demonstrative of the continuous improvement expected of a DOE-VPP participant. The Team recommends that CHPRC continue to participate in DOE-VPP and be elevated to Star status.

Appendix A: Onsite VPP Assessment Team Roster

Management

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