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

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
March 8-17, 2011

U.S. Department of Energy
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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 March 8-17, 2011, 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.

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ABBREVIATIONS AND ACRONYMS

ACES	Access Control Entry System
ARRA	American Recovery and Reinvestment Act
AJHA	Automated Job Hazard Analysis
AMH/CSC	AdvanceMed Hanford/CSC Hanford Occupational Health Services
BBS	Behavior-Based Safety
BCA	Beryllium Control Areas
BWP	Beryllium Work Permit
BLS	Bureau of Labor Statistics
CBDPP	Chronic Beryllium Disease Prevention Program
CBT	Computer-Based Training
CFR	Code of Federal Regulations
CGET	CHPRC General Employees Training
CHPRC	CH2M Hill Plateau Remediation Company, Inc.
CP-D&D	Central Plateau Deactivation and Decommissioning
CPOF	Conditional Payment of Fee
CRRS	Condition Reporting and Resolution System
D&D	Deactivation and Decommissioning
DART	Days Away, Restricted, or Transferred
DOE	Department of Energy
DOE-RL	DOE Richland Operations Office
EJTA	Employee Job Task Analysis
EPC	Engineering Projects and Construction
EMS	Environment Management System
EP	Emergency Planning
ESRB	Executive Safety Review Board
EZAC	Employee Zero Accident Councils
FFTF	Fast Flux Test Facility
FY	Fiscal Year
GERT	General Employee Radiological Training
GHA	General Industrial Hazards Analysis
GOAL	Get Out and Look Around
HAMMER	Volpentest Hazardous Materials Management and Emergency Response Training Center
HAMTC	Hanford Atomic Metal Trades Council
HGET	Hanford General Employee Training
HRB	Hazard Review Board
HSS	Office of Health, Safety and Security
ICAP	Integrated Corrective Action Plan
IPIP	Integrated Performance Improvement Plan
ISMS	Integrated Safety Management System
ITEM	Integrated Training Electronic Matrix
MSA	Mission Support Alliance, LLC
NAICS	North American Industry Classification System
NCO	Nuclear Chemical Operator
OJT	On-the-Job Training
OSHA	Occupational Safety and Health Administration

PAPR	Powered Air Purifying Respirator
PFP	Plutonium Finishing Plant
PM	Preventive Maintenance
POMC	Performance Objectives, Measures, and Commitments
PPE	Personal Protective Equipment
PZAC	President's Zero Accident Council
RCT	Radiological Control Technician
RWP	Radiological Work Permit
S&GRP	Soil and Groundwater Remediation Project
SME	Subject Matter Expert
STS	Safety-Trained Supervisors
Team	HSS DOE-VPP Team
TRC	Total Recordable Case
VPP	Voluntary Protection Program
VPPPA	Voluntary Protection Program Participants' Association
WFMP	Waste and Fuels Management Project
WOW	Workers Observing Workers

EXECUTIVE SUMMARY

CH2M Hill Plateau Remediation Company, Inc. (CHPRC), is a Washington State company formed by CH2M HILL Constructors, Inc. CHPRC assumed responsibility for the Plateau Remediation Contract at the Hanford Site on October 1, 2008, that included a work scope previously performed by five individual Department of Energy (DOE) Voluntary Protection Program (VPP) Star participants (all under the previous contractor). CHPRC elected to continue participating in DOE-VPP under transitional guidance issued by the Office of Health, Safety and Security (HSS) in August 2008, and pursue DOE-VPP Star status for the entire company as a single participant. That transitional status required a modified application and an onsite assessment by HSS DOE-VPP Team (Team). This report documents the results of that assessment.

The Plateau Remediation Contract covers primarily the Central Plateau, including the 200-East and West areas of the Hanford Site (including the Plutonium Finishing Plant), groundwater remediation across the entire Hanford Site, and the 100-K areas. Additional projects across the Hanford Site were also funded through the American Recovery and Reinvestment Act (ARRA).

Since the new Plateau Remediation Contract went into effect in October 2008, CHPRC has faced several major challenges. Changes in the structure of the organization, the decision to pursue DOE-VPP Star status for the entire organization rather than by project, the infusion of ARRA funds and the resultant doubling of the workforce, aggressive target dates for completion of ARRA projects, and now the prospect of large-scale workforce reductions have all created distractions that have a negative impact on the overall safety culture. This does not mean the site or the workers are unsafe, but the overall focus and drive toward safety excellence as a single company has not yet achieved the levels expected of a DOE-VPP Star site. Accident and injury categorization, recording, and reporting practices, combined with the reference to total recordable case and days, away, restricted, or transferred case rates in the award fee process, may be masking an upward trend in injury rates. While the vast majority of workers believe in the CHPRC commitment to safety, the belief by a small segment of the workforce that they cannot raise safety issues without fear of retaliation, the associated distrust of some managers, and the lack of understanding of worker rights under title 10, Code of Federal Regulations, part 851, must be addressed and resolved by CHPRC managers. However, CHPRC managers and workers alike are committed to reaching DOE-VPP Star status, and many improvements are being made.

CHPRC has effective tools for performing worksite analysis, but needs to ensure those tools are used and include worker input and concerns, assumptions are recognized and eliminated, and effective controls are clearly identified. Many good examples of effective controls, including the use of mockups, were observed by the Team. Training for all personnel was effective, but delinquencies and overdue training may be creating additional challenges for work assignments, particularly in radiological controls. Training to ensure workers recognize unanticipated hazards or unplanned situations and react appropriately by backing out and stopping work must be reinforced.

The Team recognizes that CHPRC has made significant progress toward achieving DOE-VPP Star status for the Company as a whole. Changes to the program scope and structure under the new contract have been more extensive than originally anticipated by CHPRC. As such, the

Team is recommending that CHPRC be moved from the transitional status and be admitted to DOE-VPP as a new applicant at the Merit level.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
CHPRC managers need to make a more concerted effort to be present at locations where seemingly routine work is being performed in potentially high-hazard areas and use their presence to reinforce their expectations and beliefs of *production through safety*.	**7**
CHPRC, MSA, and DOE-RL should work together to improve resource assignments and ensure CHPRC has access to the workers needed to perform its mission.	**8**
CHPRC needs to work with DOE-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.	**9**
CHPRC should revise its process for determining if a work restriction prevents a worker from performing one or more of their routine duties referred to in the EJTA and job descriptions.	**9**
CHPRC should work with AMH/CSC to ensure work restrictions identified by medical staff clearly relate to tasks identified in the EJTA.	**9**
CHPRC needs to continue developing a more integrated self-assessment process, focus on the areas already identified in the ICAP, and embrace constructive criticism of programs, processes, and procedures.	**11**
CHPRC should ensure all work areas are being represented by appropriate employees, as well as management, at committee meetings.	**13**
CHPRC and HAMTC need to actively seek and reach out to those workers that may feel disenfranchised and address their concerns.	**14**
CHPRC should ensure that HAMTC Safety Representatives are given sufficient notice of all critiques and feedback sessions in order to allow them to be valuable participants.	**14**
CHPRC should revise the Job Hazard Analysis process to ensure the reasoning for selecting specific controls is clearly documented, particularly when no regulatory or procedural requirements exist or are not adequate.	**18**
CHPRC should consider sharing the pilot work control program with the workers across the other projects to facilitate its implementation once the pilot process is complete.	**19**
CHPRC should ensure that the workers recognize and understand changed conditions that need further analysis to ensure proper controls are implemented to eliminate or mitigate unanticipated hazards.	**19**

CHPRC should ensure workers participate in safety walkdowns and assessments to provide opportunities for the workforce to learn and apply observations garnered from these experiences to their work location.	**20**
CHPRC needs to reevaluate and better define its expectations regarding RWP control limits in its policy and guidance documents to ensure appropriate radiological control limits are assigned to the RWP.	**25**
CHPRC needs to work with AMH/CSC staff to implement mechanisms that link job restrictions identified on the injury report to tasks or duties identified on the EJTA.	**26**
CHPRC should work with HAMTC, DOE-RL, AMH/CSC, and MSA to identify worker concerns with emergency medical response capabilities, and ensure their concerns are adequately addressed.	**27**
CHPRC should consider encouraging supervisors and managers to pursue STS certification.	**29**
CHPRC needs to review worker training to ensure it effectively prepares the workers to deal with conditions that were not planned or expected.	**29**
CHPRC should ensure workers have the computer access needed to access e-mail notifying them of expiring training and complete CBT.	**30**
CHPRC should review the process linking HGET/CGET training to site access and ensure that employees complete their annual HGET/CGET prior to expiration.	**31**
CHPRC should develop a system that automatically generates the delinquencies and delinquency rates using the training data ITEM.	**31**
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I. INTRODUCTION

CH2MHill Plateau Remediation Company, Inc. (CHPRC), is a Washington State company formed by CH2M HILL Constructors, Inc. The CHPRC team also includes: AREVA Federal Services, LLC; East Tennessee Materials & Energy Corporation, Inc.; and Fluor Federal Services, Inc., as major subcontractors. 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 (DOE-RL) provides day-to-day oversight and management of the Plateau Remediation Contract.

CHPRC assumed responsibility for the Plateau Remediation Contract on October 1, 2008. As part of the transition from the previous contractor, CHPRC acquired five DOE Voluntary Protection Program (VPP) Star sites: Fast Flux Test Facility (FFTF), Central Plateau Deactivation and Decommissioning (CP-D&D), Plutonium Finishing Plant (PFP), Groundwater Remediation Project, and Waste Stabilization and Disposition. FFTF is closed with no employees working at the facility. CP-D&D is now included in the Deactivation and Decommissioning (D&D) Project that includes FFTF and the 100 K-Area. Waste Stabilization and Disposition has become the Waste and Fuels Management Project (WFMP) and includes the Canister Storage Building. The Groundwater Remediation Project has been expanded to the Soil and Groundwater Remediation Project (S&GRP) and now includes some of the soil remediation work that was performed by the former CP-D&D Project. A new organization, Engineering Projects and Construction (EPC) was also formed from elements of the previous contractor.

In August 2008, the Office of Health, Safety and Security (HSS) issued guidance to contractors desiring to transition existing DOE-VPP Star status to the new contract. The guidance included written commitments from the new contractor management team and any affected bargaining units. Both Hanford Atomic Metal Trades Council (HAMTC) and CHPRC made such commitments. To complete the transition, the contractor was required to submit a DOE-VPP application that clearly defines those areas that have changed from the previous contractor, and then HSS would perform an onsite evaluation to determine if the new contractor warrants recognition as a Star site.

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 FFTF; and long-term surveillance and maintenance of decommissioned facilities and waste sites.

In 2009, CHPRC received $1.3 billion of the American Recovery and Reinvestment Act (ARRA) funding from DOE-RL to demolish nuclear and support facilities, remediate waste sites, remediate contaminated groundwater, and retrieve solid waste from burial grounds. 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.

CHPRC submitted its DOE-VPP application to DOE-RL in early January 2011. Throughout the transition process, DOE-RL has expressed concerns related to CHPRC safety performance. In April 2010, DOE-RL issued a Conditional Payment of Fee letter citing multiple noncompliances or adverse performance trends that either have, or may have, a negative impact to the public, worker, or environment, or that indicated a programmatic breakdown. DOE-RL was not satisfied with the initial corrective action plan submitted by CHPRC. CHPRC subsequently developed an Integrated Performance Improvement Plan (IPIP) and then worked with DOE-RL to develop an Integrated Corrective Action Plan (ICAP). Corrective actions under these plans continue, and DOE-RL discussed these concerns with HSS during the application review. DOE-RL forwarded the application to HSS in February 2011.

At the time of this review, CHPRC employed approximately 3,500 workers (includes approximately 1,400 preselected subcontractor workers). The workforce consists of multiple unions all represented through HAMTC (approximately 1,300 workers), managers, and other exempt and nonexempt personnel. Workers are faced with the full spectrum of industrial, radiological, and chemical hazards associated with remediation and cleanup of nuclear facilities and waste burial grounds.

As of April 5, 2011, AdvanceMed Hanford's (AMH) parent company CSC relinquished its rights to the name AdvanceMed. As a result, the health services contract name has been changed to CSC Hanford Occupational Health Services (CSC HOHS). This change does not represent a contract change since AMH has been a part of the CSC parent company throughout its contract at Hanford. Because this transition is still occurring at the time of this report, the term AMH/CSC will be utilized when referencing the medical services at Hanford.

HSS performed the onsite assessment from March 8-17, 2011. The review consisted of field work 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
2008	579,513	5	1.73	0	0.00
2009	3,477,127	25	1.44	16	0.92
2010	4,115,604	28	1.36	16	0.78
3-Year Total	8,172,244	58	1.42	32	0.78
Bureau of Labor Statistics (BLS-2009) average for NAICS** # 5629 (Remediation and Other Waste-Management Services)			4.2		2.1
Injury Incidence/Lost Workdays Case Rate (CHPRC Subcontractors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2008	175,381	1	1.14	0	0.00
2009	1,961,980	5	0.51	2	0.20
2010	3,507,035	5	0.29	6	0.34
3-Year Total	5,644,396	11	0.39	8	0.28
Bureau of Labor Statistics (BLS-2009) average for NAICS** # 5629 (Remediation and Other Waste-Management Services)			4.2		2.1
Total CHPRC and Subcontractors (3 Years)			1.0		.58

* Days Away, Restricted or Transferred
** North American Industry Classification System

TRC Incidence Rate, including subcontractors: 1.0
DART Case Rate, including construction and subcontractors: 0.58

As discussed in the Management Leadership section, in August 2010, during a surveillance of the Occupational Safety and Health Administration (OSHA) 300 records, DOE-RL identified 21 cases that, in their opinion, should have been included as recordable cases. That surveillance was not transmitted to CHPRC until March 14, 2011. Although aware of the concern, CHPRC has not changed its process for identifying whether injury cases are considered *recordable*. The Team is concerned that a combination of the overreliance on supervisors' understanding of the OSHA interpretation, nonspecific restrictions not tied to specific worker duties, and the reference to TRC and DART case rates as an element of contractor award fee may be masking an upward trend in TRC and DART case rates. Inclusion of the 21 cases identified by DOE-RL would nearly double the TRC rate for 2009 and could similarly affect the rate for 2010. To its credit, even doubling its current injury rates, CHPRC is still almost 25 percent below the comparison industry rate. As discussed in Management Leadership section, CHPRC needs to evaluate its

process for reviewing work restrictions, tie work restrictions more closely to the Employee Job Task Analysis (EJTA), and work with AMH/CSC to ensure identified work restrictions relate to the EJTA.

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.

CHPRC has established management systems and processes that define roles, responsibilities, and authorities for safety and health. The PRC-POL-SH-5053, CHPRC *Safety, Health, Security, Quality, and Environmental Policy*, applies 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. DOE-RL initially reviewed ISMS in February 2010. That review found that with the exception of the Waste Retrieval Project, CHPRC had defined and implemented adequate ISMS. That review also documented four other concerns not related to the Waste Retrieval Project: (1) concerns related to the specificity of controls in work packages; (2) lack of feedback related to maintenance activities; (3) ineffective integration of safety controls during work planning; and (4) inconsistent definition and understanding of the matrixed roles and responsibilities for nuclear safety and engineering staff. The Waste Retrieval Project had other concerns that needed to be addressed, and the ISMS was approved by DOE-RL in December 2010, but maintenance of that approval was made contingent upon effective completion of all corrective actions related to the ISMS verification, and DOE-RL verification of the same.

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 title 10, Code of Federal Regulations, part 851 (10 CFR 851), *Worker Safety and Health Program.*

CHPRC has established two management processes for review of higher hazard work. First, each project within the Plateau Remediation Contract has a Hazard Review Board (HRB) for the review of: (1) select work activities, particularly complex, high-hazard tasks; (2) safety measures that are implemented to support this work; and (3) personnel overseeing the work activities to ensure their understanding of 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. The HRB is used 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 work must be reviewed by the HRB. 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 CHPRC senior management team is clear in its commitment that safety provides the means to achieve its mission of cleaning up the Central Plateau of the Hanford Site. *Production through safety* was the watchword for all senior managers interviewed by the Team. In August 2009, the Chief Operating Officer gave a talk to the S&GRP entitled "Deliberate Speed." He has given this talk at several other meetings and classes, and it is a personal story with a powerful message of how to achieve safe, efficient production through deliberate actions rather than trying to work quickly. That video had been shown at many other meetings across the Company, and most mid-level managers remembered the video. Some workers contacted by the Team remembered the video, but many more did not. Some workers interviewed by the Team expressed concerns that mission completion was more important than safety. A majority of these concerns related to D&D work being performed in the 200 East and West areas, particularly in the steam plants and U-Plant. In these areas, the message from the senior management team was being negated by actions that appeared to promote production without due regard for safety.

Over the past 2 years, CHPRC has experienced many challenges that may be contributing to this perception by the workers. First is the contract change itself. Many workers liked the previous contractor and the support they had from those managers. They perceived the reason for the contract change was DOE's dissatisfaction with mission progress. Consequently, they believe that many changes in processes and procedures are intended to accelerate mission goals. Secondly, the infusion of funds and workers under ARRA brought a large population of workers into the site with little or no previous experience at the Hanford Site. These workers had not previously adopted the site's safety culture, and expected managers and supervisors to push production over safety. Third, as the ARRA funding comes to an end, workers are anticipating broad workforce restructuring and layoffs. Retention of workers will be based on rankings (for nonbargaining unit workers) or through contractually established methods (for bargaining unit personnel). Workers concerned about individual rankings perceive that production success will be more important than safety. In some cases, managers may be unwittingly contributing to these perceptions.

In one case in particular, the Team is concerned about the nonverbal message being received by workers. The U-Plant project was selected as a major ARRA accelerated cleanup project. In order to support the final date of September 30, 2011, CHPRC decided to move forward with work before the plant was put into a *cold and dark* configuration. Cold and dark, the condition where all sources of hazardous energy have been removed by disconnecting and opening an air

gap between the energy sources and the building, has been a major contributor to safe, successful cleanup projects throughout the DOE complex (see Hazard Prevention and Control). In the case of U-Plant, the decision not to establish the cold and dark configuration is presenting many challenges to the workforce in controlling and avoiding hazards. Over the past 2 years, there have been several occurrences related to inadvertent or accidental contact with hazardous energy sources that would have been removed in a cold and dark configuration. D&D workers inexperienced with other hazardous energy controls (lockout/tagout, for example) are making assumptions regarding the condition of systems or locations of hazards that place them at risk when conducting activities. During interviews, workers reported cases where managers and supervisors instructed workers to continue activities even when concerns about the work were raised by the workers. Although one manager was disciplined for failure to adhere to lockout/tagout requirements, other cases have been observed by workers that appear to promote the production objective.

Lack of senior management presence at the worksites is probably one of the strongest contributors to these misperceptions. In many cases, senior managers (project vice presidents) are making concerted efforts to be present at the worksites. For example, a corrective action from the ISMS verification was implementation of a Senior Supervisory Watch and increased use of management observations. Since implementing those actions, PFP has seen a noticeable decline in operational events and other occurrences. In other facilities, senior management observations, visits, or Senior Supervisory Watches are not always conducted with sufficient frequency and duration to encourage workers to step-back or stop-work when they have questions or concerns. In a few cases, senior managers have not taken the opportunity to visit or observe workers performing the most hazardous work or riskiest operations. CHPRC established an expectation that 25 percent of senior managers' time, and 50 percent of mid-level managers' time be spent observing and interfacing directly with workers. Managers, in some cases, are struggling to meet those expectations due to external conflicts and pressure on their schedules. These interfaces with workers in the workplace are an invaluable tool for reinforcing the *production through safety* message, and all CHPRC managers should ensure they are using these opportunities to their fullest measure. CHPRC managers should make a more concerted effort to be present at locations where seemingly routine work is being performed in potentially high-hazard areas, such as U-Plant. Managers must use their presence in the workplace as an opportunity to reinforce their expectations and beliefs of *production through safety*.

Opportunity for Improvement: CHPRC managers need to make a more concerted effort to be present at locations where seemingly routine work is being performed in potentially high-hazard areas and use their presence to reinforce their expectations and beliefs of *production through safety*.

CHPRC has recognized the difficulties and inconsistencies in communications throughout the organization, but has only had limited success in improving those communications. In response to those difficulties, CHPRC created a Communications Directorate and hired a new Communications Director. That directorate has been working to identify and develop effective communications strategies, methods, and tools for both internal and external communications. Some tools being used, such as the weekly *InSite* videos are professionally produced, contain good information for all personnel, are readily available, and frequently used. These strategies, methods, and tools need time to demonstrate their effectiveness, mature into a comprehensive communication program, and eliminate the existing communication issues.

Availability of safety and health resources is generally adequate, including Personal Protective Equipment (PPE), engineered controls, and the use of mockups. In some cases, there have been shortages of subject matter expertise, particularly in radiological control engineers at PFP. These shortages have been driven by a lack of qualified personnel being available in the job market, rather than a lack of commitment by managers to fill those positions. Another stress on radiological controls at PFP has been overdue training on the part of radiological control technicians (RCT). Some RCT training at PFP is overdue because technicians have not been given time to complete those training sessions. Although RCTs have not been assigned to work for which they are not qualified, the overdue training results in reduced flexibility for job assignments and additional difficulty ensuring RCTs are available to support all work. CHPRC took action during this assessment to assign additional radiological controls expertise to PFP. The Chief Operating Officer also met with radiological controls and operations personnel to ensure senior managers' expectations were clearly understood.

Another resource challenge faced by CHPRC is related to the contract structure now in place between DOE-RL, CHPRC, and the Mission Support Alliance, LLC (MSA). MSA is contractually required to supply certain trades people that CHPRC relies on to perform its mission. In most cases, those MSA personnel work full-time on CHPRC tasks and have become fully embedded with the CHPRC workforce. In some cases, however, personnel are only used part-time. In those cases, the personnel supplied may not be fully knowledgeable of CHPRC tasks or familiar with CHPRC personnel. Further, the timing and availability of those MSA personnel can have a significant effect on CHPRC project work completion. CHPRC meets weekly with MSA to negotiate and plan for resource needs, but MSA is not always able to provide the necessary personnel. MSA is also challenged by this arrangement to keep personnel fully occupied, and as such does not maintain sufficient staff at all times to support periods of high workloads. To alleviate these issues and provide CHPRC the ability to better plan for workloads, CHPRC, MSA, and DOE-RL should work together to improve resource assignments and ensure CHPRC has access to the workers needed to perform its mission.

Opportunity for Improvement: CHPRC, MSA, and DOE-RL should work together to improve resource assignments and ensure CHPRC has access to the workers needed to perform its mission.

Resources have been provided for employee recognition and rewards, including resources from fee where DOE could not provide funding. CHPRC had contract resources provided by DOE in Fiscal Year (FY) 2010 for employee recognition and rewards. Due to budget constraints in FY 2011, DOE eliminated those resources from the contract. CH2M Hill, the parent company for CHPRC, has provided funds out of fee to continue providing those resources. The resources are split between project directors on a per-employee basis for use by managers, supervisors, and safety committees.

CHPRC works with DOE-RL to negotiate annual Performance Objectives, Measures, and Commitments (POMC) which are considered by RL in the annual award fee process. The POMC for FY 2010 and FY 2011 contained several positive actions focused on safety improvements. The Team was concerned, however, that there are annual POMCs tied directly to TRC and DART case rates. In his opening remarks at the Voluntary Protection Program Participants' Association (VPPPA) National Conference in August 2010, Dr. David Michaels, Assistant Secretary of Labor for Occupational Safety and Health, stated:

> *We have found that incentive programs based primarily on injury and illness numbers often have the effect of discouraging workers from reporting an injury or illness. We cannot tolerate programs that provide this kind of negative reinforcement and this type of program would keep a company out of the VPP until the program or practice is corrected.*

The VPPPA has supported this position for several years, and HSS agrees. While TRC and DART case rates are used 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. Recognizing this potential, DOE has been closely reviewing accident and injury statistics in connection with VPP assessments and interviewing workers specifically about their willingness to report injuries. During this assessment, there were some indications that workers might be hesitant to report minor injuries, but there was no indication that workers were not reporting injuries. DOE-RL conducted a surveillance of CHPRC injury and illness files in August 2010 that found 21 cases that should have been recorded in the OSHA 300 log but were not. Further review by the Team indicated similar reporting practices continued into 2011. The surveillance by DOE-RL was formally transmitted to CHPRC on March 14, 2011, so CHPRC did not have an opportunity to address the concerns raised by DOE-RL prior to this assessment. Although CHPRC is working with DOE-RL, and DOE-RL agreed that some of the cases were not recordable, the overall conclusions and issues were not changed. Most of the cases in question relate to gray areas in the OSHA injury and illness reporting handbook, and interpretations as to whether the restriction identified by the AMH/CSC medical personnel prevents the worker from performing one or more of their routine duties. CHPRC currently relies heavily on the determination by the individual's supervisor that the person can do some work, rather than referencing the EJTA or formal job descriptions to determine if the worker cannot perform one or more of their routine duties. In many of these cases the restriction identified by AMH/CSC is not specific enough to make such a determination. As a result, CHPRC typically interprets these gray area cases as *not recordable*. The use of TRC and DART case rates as a consideration for a portion of the annual contract award fee could be mistakenly interpreted as discouraging reporting. CHPRC needs to work with DOE-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. Additionally, CHPRC should revise its process for determining if a work restriction prevents a worker from performing one or more of their routine duties to refer to the EJTA and job descriptions. CHPRC should also work with AMH/CSC to ensure work restrictions identified by medical staff clearly relate to tasks identified in the EJTA.

Opportunity for Improvement: CHPRC needs to work with DOE-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 revise its process for determining if a work restriction prevents a worker from performing one or more of their routine duties referred to in the EJTA and job descriptions.

Opportunity for Improvement: CHPRC should work with AMH/CSC to ensure work restrictions identified by medical staff clearly relate to tasks identified in the EJTA.

There was a significant discussion throughout the assessment regarding the effectiveness of the CHPRC organization. CHPRC has taken a project-oriented approach to the plateau remediation mission, and as such, all personnel necessary for completion of the project work report directly to the project manager, including safety and health personnel. Safety and health personnel maintain a *dotted line* relationship to the central Vice President for Safety, Health, Security, and Quality. The CHPRC view is that this organizational structure provides greater accountability for safety and health personnel to support safe production and find safe approaches without becoming *safety cops*. Safety and health personnel retain the ability to reach back to the central organization for additional expertise when needed. The previous contractor had a similar mission approach, but safety and health personnel were assigned to the central environment, safety, health, and quality organization with a dotted line relationship to the project. Either organizational structure is viable as long as the safety and health personnel are confident that their expertise and advice is heeded. In most cases observed by the Team, safety and health personnel had no concern regarding the organizational structure. In the case of RCTs at PFP, there were concerns that their expertise was not heeded. As will be discussed later under Worksite Analysis, and Hazard Prevention and Control sections, RCTs in some cases at PFP were not being specific regarding how to implement controls during the work planning process. Since controls were not specific, nuclear chemical operators (NCO) would implement controls as they saw fit. This practice was leading to disagreements between NCOs and RCTs at the time of work. These disagreements were leading to enmity between the two groups. Actions by managers during the assessment to clarify expectations for both RCTs and NCOs must be followed up in the coming months to ensure all personnel understand and carry out their responsibilities safely and cooperatively, and work out specific details during the work planning process.

Critical self-assessment is another essential function to support the continuous improvement culture expected at a DOE-VPP site. CHPRC has identified its difficulty over the past 2 years implementing an effective self-assessment process that meets both DOE-RL and DOE-VPP expectations. CHPRC has a system for scheduling, tracking, and identifying corrective actions from self-assessments. The Condition Reporting and Resolution System (CRRS) contains between 700 and 900 scheduled assessments on an annual basis, and is tracking well over 4,000 corrective actions annually. Yet this system failed to recognize systemic weaknesses identified by DOE-RL that led to a conditional payment of fee (CPOF) in April 2010. CHPRC identified and implemented corrective actions for those conditions, but DOE-RL was not satisfied that the initial corrective actions had addressed the underlying causes and weaknesses. Other subsequent events and assessments had resulted in additional corrective actions that overlapped, but were not well integrated. Consequently, CHPRC developed an Integrated Performance Improvement Plan (IPIP). The IPIP identified four key continuous improvement elements: (1) Corrective Action Management; (2) Work Management/Work Control; (3) Organizational Performance; and (4) Self-Assessment and Performance Monitoring. In November 2010, a corporate team from CH2M Hill conducted a mid-point, effectiveness assessment of CHPRC progress. That review concluded that CHPRC was making progress, but that "the management team needed to continue, accelerate, and maintain the focus and attention on the integrated approach and institutionalizing the improvements, not just completion of discrete actions."

Since that mid-point assessment, CHPRC and DOE-RL worked cooperatively to develop an ICAP that captures most of the actions contained in the IPIP, and was accepted by DOE-RL in February 2011 (see Worksite Analysis discussion). That plan addresses many of the conditions observed by the Team, and should help CHPRC implement and maintain a culture of continuous improvement. CHPRC continues making progress on those actions. To address concerns with

self-assessment and corrective action management, CHPRC created a new Integration & Improvement Management organization that reports to the Vice President of Safety, Health, Security & Quality. That organization now has primary responsibility for performance trending and analysis, corrective action management, contractor assurance, lessons learned, human performance, and maintenance of ISMS. Many of the actions, particularly those related to changing processes, will require time to mature and demonstrate effectiveness. The Team agrees that further integration of the self-assessment and corrective action process is essential to ensuring the process has value to both CHPRC and DOE.

An expectation of DOE-VPP is that the participant will submit an annual program evaluation report. The annual program evaluation should demonstrate that either program problems have been properly analyzed and understood or that recommendations for correction or improvement have been fully implemented. In 2010, CHPRC submitted an annual report covering 2009, but had not yet submitted its 2011 report covering 2010. The 2009 report followed the same process used under the previous contractor, and consisted of a broad range of personnel from across the site. The report did identify some opportunities for improvement, but was not sufficiently comprehensive or integrated with other site assessments to identify the weaknesses later identified by DOE-RL. Those weaknesses led to the failure of the ISMS verification in the WFMP and the CPOF letter. The self-assessment also failed to identify that some workers had concerns over potential retaliation for raising safety issues (see Employee Involvement), and concerns regarding recording of injury and illness statistics identified by DOE-RL.

The value of critical self-assessment is exemplified by the WFMP. A previous DOE-VPP Star participant, this project had not been reevaluated since its initial certification in 2006, and has relied solely on its own self-assessments. Over the course of time, weaknesses in implementation of ISMS had been emerging, but were not identified. Those issues with waste retrieval were identified by DOE-RL and resulted in CHPRC not passing its initial ISMS verification and an extended shutdown of waste retrieval activities. The WFMP took aggressive corrective actions and has made significant improvements in work control, operations, and emergency management. Had the project effectively self-identified the need for corrective actions, delays related to the ISMS verification would have been avoided. As a result of those corrective actions, the WFMP was recognized by the Team as performing its mission safely.

In order to fully implement the culture of continuous improvement, CHPRC needs to continue developing a more integrated self-assessment process, focus on the areas already identified in the ICAP, and embrace constructive criticism of programs, processes, and procedures.

Opportunity for Improvement: CHPRC needs to continue developing a more integrated self-assessment process, focus on the areas already identified in the ICAP, and embrace constructive criticism of programs, processes, and procedures.

Conclusion

CHPRC managers have faced a number of significant challenges since the contract transition in 2008. They have dealt effectively with some of those challenges, but others remain or have proven more difficult to address. The IPIP and the ICAP provide a good roadmap for the improvements that need to be made. Greater manager presence and interface directly with the workers, more effective communication of the *production through safety* message, elimination of

mixed messages, and implementation of effective, integrated, and critical self-assessments are essential to developing the culture of continuous improvement necessary for DOE-VPP Star status.

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.

CHPRC inherited many employee involvement mechanisms from the previous contractor. These include the Employee Zero Accident Councils (EZAC), the President's Zero Accident Council (PZAC), and other Hanford Site-wide committees. These committees collectively provide a forum for workers and managers to openly discuss issues and concerns, propose new ideas and approaches, and jointly promote a culture of continuous improvement and safety excellence. Members of these committees are very actively involved in many different aspects of the CHPRC safety program and are generally very optimistic regarding safety improvement opportunities. Other meaningful employee involvement approaches include participation in work planning and hazard analysis processes, worksite inspections, the Annual Hanford Safety Exposition, accident investigations and incident critiques, and the Workers Observing Workers (WOW) Behavior-Based Safety (BBS) program.

Most workers interviewed stated that they are given opportunities to participate in safety committees (PZAC, EZAC, VPP), but some committee members felt that the actual participation has not been consistently as high as the committees would hope. A review of attendance rosters for committee meetings demonstrated sporadic attendance by middle managers on some committees, and all locations covered by the committees were not always represented. Some committee members expressed concern that the committees may become tools for managers to drive changes with employees not taking active leadership of the committees. CHPRC should ensure that all work areas within a project are equitably represented by both workers and managers and that, where practical, employees are encouraged by managers to assume active leadership of the committee and committee activities.

Opportunity for Improvement: CHPRC should ensure all work areas are being represented by appropriate employees, as well as management, at committee meetings.

Most employees interviewed were knowledgeable about hazards in their workplace and how they were protected from those hazards. They were not hesitant about reporting minor injuries, and were knowledgeable about the stop-work process.

However, some workers in the D&D Project expressed concern that in some cases, the stop-work process was not always correctly used and documented adequately to capture the concern or the resolution. Some D&D workers believed their managers considered the stop-work process simply as a means for workers to keep from working. CHPRC is required by the contract to follow the Hanford Site-wide stop-work procedure. That procedure does not define a threshold between stop work and less formal timeouts or step-backs. CHPRC has been trying to use less formal methods to address safety concerns before resorting to formal stop work, but the

difference is not clearly defined, and in some cases workers believe informal stop work is being used to circumvent more formal stop work in accordance with the site-wide process.

A few D&D workers expressed a fear of retaliation related to stop work. In one case observed during this assessment, D&D workers reportedly considered using a stop work for the U-Canyon asbestos abatement job that resulted in the potential contact by workers with live electrical wires. The workers continued the job even though concerns about live electrical components identified during the work planning process were not addressed. After the event occurred, workers from the crew involved were sent to a variety of other jobs. Managers and supervisors firmly believed it had been explained to the work crew they were being sent to other jobs to support work and keep the workers gainfully employed, but the timing of the action only served to reinforce the workers' concerns about retaliation. The existence of these fears, valid or not, is counterproductive to the necessary mutual trust and partnership between employees and managers (see Management Leadership for the Opportunity for Improvement). CHPRC and HAMTC need to actively seek and reach out to those workers that may feel disenfranchised and address their concerns.

Opportunity for Improvement: CHPRC and HAMTC need to actively seek and reach out to those workers that may feel disenfranchised and address their concerns.

HAMTC safety representatives continue to provide an effective conduit between workers and managers for safety concerns and issues. Additional safety representatives were added in response to the ARRA expansion. 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 the EZACs on a regular basis. In some cases, primarily D&D, workers may not be raising concerns to the safety representatives because of the fear of perceived retaliation or lack of trust previously discussed.

HAMTC safety representatives have been trained in accident investigation techniques and are required by procedure and the bargaining agreement to be invited to any accident or incident critiques. Their involvement is encouraged to help workers feel comfortable in critiques, and help ensure workers are treated fairly and justly during the critique process. Unfortunately, in many cases the HAMTC safety representatives are not receiving timely notification that a critique is scheduled. This is limiting their ability to be effective participants in the critique. CHPRC should ensure that HAMTC safety representatives are given sufficient notice of all critiques and feedback sessions in order to allow them to be valuable participants.

Opportunity for Improvement: CHPRC should ensure that HAMTC Safety Representatives are given sufficient notice of all critiques and feedback sessions in order to allow them to be valuable participants.

CHPRC has implemented several programs for employees to receive rewards and recognition related to safety promotions and activities. SafeZone has been in place for over 1 year and allows employees to gain yardage based on safety-related activities and suggestions. Employees can use that yardage to get safety award items. GOAL (Get Out and Look Around) is a vehicle safety promotion to encourage workers to look around their entire vehicle before getting in and driving. Magnetic stickers are placed randomly on vehicles, and a worker finding one on their vehicle can turn the sticker in for a small prize. In order to promote that program, one of the

HAMTC safety representatives and a manager each provided a personal cash reward and signed stickers. The workers that found those stickers each received the special cash award. The WOW program is a BBS program that encourages workers to either perform observations or be observed in an effort to raise workers' awareness of unsafe or at-risk behaviors. Safety log books/safety issues and ideas are used at some projects as an informal means that afford employees the opportunity to identify and resolve safety issues through their project or facility EZAC. Typically, a member of EZAC maintains the log book and, in many cases, the information is entered in CRRS. Periodically, open safety log items are addressed at a PZAC meeting for senior management attention. These programs are well structured to reinforce safe behaviors. A significant number of workers encountered by the Team were, unfortunately, either unaware of these programs, or not sure what the programs were. As discussed in the Management Leadership section, the Communications Director is working to improve the marketing of these programs to the workforce.

While CHPRC has implemented several programs to encourage Employee Involvement, it has not implemented methods to measure those programs' effectiveness. As a means of providing feedback to the employees running those programs, CHPRC should find ways to determine what percentage of employees or what segments of the employee population is participating in those programs. Goals for participation should be established, and the Communications Directorate should work with the employee teams to identify more effective promotional strategies where those goals are not being met.

The Team did identify some good examples of worker involvement and cooperation between teams to identify and implement more effective work methods and approaches. For example, workers at PFP were clearly involved in identifying and implementing methods for cleaning and reducing the size of gloveboxes (see Hazard Prevention and Control). Similarly, in the S&GRP, workers expressed satisfaction that they were involved in actively developing work methods and processes. D&D employees worked with the engineers to build a mockup to facilitate the 209E Tank Size Reduction Project. That project was to cut slab tanks that once contained quantities of plutonium or uranium in solution. The process involved construction of a shroud that would be placed over and around the tank to contain any contamination that might be released during size reduction activities. Employees were involved in the cutting tool selection process, the construction and fabrication of the tank cutting shroud mockups, the ventilation design, and the final fabrication of the shroud.

In addition to local participation, workers throughout CHPRC are encouraged to attend various safety conferences and activities (VPPPA conferences, Hanford Safety Exposition, and the Annual DOE Integrated Safety Management conference). This participation is encouraged beyond committee members. Workers that want to attend must express that desire, and then names are drawn to determine who may attend. In addition to attending, CHPRC has also encouraged workers to prepare and present relevant safety topics at those conferences.

Worker rights and responsibilities under 10 CFR 851, *Worker Safety and Health*, are explained to workers during initial site training. Those rights are also posted on bulletin boards across the site, as well as on the CHPRC internal Web page. Despite these efforts, some D&D workers are not fully aware of their rights and responsibilities. This indicates that workers may need additional reinforcement of their rights to a safe and healthy workplace, the right to stop work, the right to seek additional information, and the right to raise concerns.

Conclusion

CHPRC has a multitude of means to permit and encourage substantive worker involvement in the safety and health program. CHPRC has supported worker initiatives, in some cases by using funds provided by the parent company where DOE could not. In a few cases, workers are not effectively using those means for a variety of reasons, including distrust of their managers and supervisors, or fear of retaliation. Further, some workers did not fully understand or exercise their rights under 10 CFR 851. The vast majority of workers encountered by the Team did not share the concerns of those few workers, but those concerns cannot be ignored. CHPRC managers were adamant in their desire for workers to participate, provide feedback, and stop work when necessary, but as discussed in the Management Leadership section, that message may not be effectively reaching all workers. In order to meet the expectation for DOE-VPP, CHPRC must actively seek and reach out to those workers that may feel disenfranchised and address their concerns.

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.

As discussed in the Management Leadership section of this report, the DOE ISMS review team concluded that ISMS is implemented by CHPRC. On Feb 17, 2011, CHPRC submitted an ICAP to address the identified issues found by the DOE ISMS review team (Implementation of Work Management and Hazards Control), as well as other concerns with Corrective Action Management, Work Management, Organizational Performance, and Self-Assessment and Performance Trending. DOE-RL approved the ICAP on Feb 24, 2011. CHPRC created a new directorate as a result of the ICAP that reports to the Chief Operating Officer. The new directorate is called the Operations Programs organization and encompasses work control, conduct of operations, process improvement, and the maintenance program. The corrective actions contained within the ICAP, once completed, need time to mature before being reevaluated for effectiveness. The recent changes in work management and hazard control across CHPRC also need time to stabilize, mature, and demonstrate effectiveness.

The workforce and the managers interviewed by the Team are well aware of the significant hazards they face on a daily basis. For example, there are Beryllium issues across the projects, heavy equipment at D&D sites, hazardous energy potentials at U-Plant, transuranic waste retrieval and deteriorating containers, repackaging of waste containers, and associated radiological and chemical hazards. CHPRC uses a documented system that is designed to capture the hazards encountered by workers across the CHPRC projects and develop controls to eliminate or mitigate those hazards. The programmatic documents are implemented by CHPRC and augmented by facility-specific procedures for operating facilities and work packages.

The process flow for hazard analysis starts with the review of work scope. The coordinator for the work determines if the work scope is skill-based work based upon a review of the Craft Specific Hazard Analysis and criteria found in Appendix B of PRC-PRO-WKM-079, *Job Hazard Analysis.* If worksite hazard analysis documents the rationale for skill-based selection, an Automated Job Hazard Analysis (AJHA) may not be needed. If the work scope is not skill-based, a review is performed to determine if a previous AJHA is available for comparison. The coordinator may perform a document search or interview workers that have previously performed similar work. If the work has not previously been done or if there are differences from the previous AJHA, a new AJHA is developed. This effort includes walkdowns with workers and subject matter experts (SME), discussions with workers on how the work will be performed and sequencing of work, hazards associated with each evolution, and the controls that are expected to mitigate or eliminate hazards. If deemed beneficial, the use of mockups is employed to identify hazards and hazard avoidance techniques and improve the work evolution. Mockups allow refinement of work in a clean environment to maximize efficiency and minimize exposures. The Team was impressed with the level of detail used in mockups at the FFTF Maintenance and Storage Facility for K-Basin work and WFMP for retrieving buried waste

containers (see Hazard Prevention and Control). The coordinator also reviews lessons learned from previous work, which provides a resource for incorporating good work practices and avoiding hazardous conditions. After compiling the inputs from affected parties, the coordinator sends the AJHA to SMEs and management for final review and approval.

PRC-PRO-WKM-079, *Job Hazard Analysis*, contains the CHPRC Task Level Hazards Analysis procedure. The scope of this procedure applies to task-specific hazards that may be encountered during execution of maintenance, operations, construction, deactivation, demolition, decommissioning, surveillance, and environmental remediation. CHPRC uses this procedure in conjunction with the AJHA software to identify, analyze, and develop controls for work activities. The AJHA software is a powerful tool that walks the users through a series of questions to evaluate the hazards and develop the controls. The questions rely on controls mandated by company procedures, Federal or State regulatory programs, or information from other sources such as Material Safety Data Sheets. PRC-GD-WKM-17132, *Automated Job Hazard Analysis Process Guide*, provides direction for using the AJHA. Contained within the guide are links to baseline hazard analysis for all employees documented in the General Industrial Hazards Analysis (GHA), and the related hazards and controls are discussed in the CHPRC General Employees Training (CGET). Also a link to the GHA documents the general hazards and controls related to hazards encountered during normal application of the craft person's skills. The GHA also serves to define the basis for skill-of-craft work to be used when developing work packages. As observed during this review, these two documents do not address the working environments where individuals performed assigned work. The AJHA guidance recommends the logic for control selection be documented. The AJHA guide states:

> *SMEs conduct any specific analysis actions required based on hazards identified and determine if any controls or other actions are warranted. SMEs acknowledge that the analyses are conducted and that the appropriate information from the analysis is applied in the controls screen.*

References to existing regulatory or company guidance can suffice for *why* the control is used, but other analyses when regulatory or procedural guidance does not exist are not being consistently documented. In other cases, controls are being selected without further analysis or regulatory reference. CHPRC should require documentation of rationale for control selection that involves calculations, professional judgment, including assumptions, or control decisions that fall outside of mandated regulatory control requirements.

Opportunity for Improvement: CHPRC should revise the Job Hazard Analysis process to ensure the reasoning for selecting specific controls is clearly documented, particularly when no regulatory or procedural requirements exist or are not adequate.

A revision to the work control process has been developed by CHPRC, but has not been released for use. The plan is to pilot it in the 100-Area D&D Project, then release to the remainder of the projects after validation. The Team was briefed on the upcoming changes to the procedure during this review. CHPRC should consider sharing the pilot program with the workers across the other projects, such that before it is released to the rest of the Company, feedback can be incorporated across all of CHPRC. This may lessen the implementation time and garner improvements that can be incorporated across the CHPRC sphere of influence and avoid additional changes as projects implement the revised process.

Opportunity for Improvement: CHPRC should consider sharing the pilot work control program with the workers across the other projects to facilitate its implementation once the pilot process is complete.

A review of Occurrence Reporting and Processing System for CHPRC indicates that there have been more than 20 events that relate to hazardous energy or the potential to release hazardous energy over the past 3 years. During this time, U-Plant D&D has experienced multiple events involving the potential to release hazardous energy. Some of these events involved lockout/tagout issues while others involved unexpected release of electrical energy. While the Team was onsite, the Plateau D&D Project encountered another hazardous energy event at U-Plant. U-Plant is undergoing decommissioning work to remove insulation, interference, equipment, and other hazards that might interfere with the long-term end-state. A walkdown was performed by insulators, other crafts, and supervisors to develop the work package. The original work package identified electrical hazards and piping interference that posed potential hazards to the insulator crew removing asbestos. Within the original work package, there were sections dedicated to electricians and pipefitters to remove these hazards and interference so the insulators could perform asbestos abatement activities. These sections were removed from the original work package, but the job was never reevaluated for the reintroduced hazards. While preparing for insulation removal on an elevated platform, an insulator pushed a pendent light out of the way. The pendent fixture separated and an apparent arc to ground was observed. The root cause and investigation conclusions of this event were still in process when the Team concluded its review.

In a separate event during this review, backshift workers discovered containers of mercury that were not previously identified at a jobsite. Instead of leaving them in their location and backing out to reevaluate the changed condition or discovery of an unanticipated hazard, the workmen assumed they could make the area safe by collecting the vials of mercury in a box. They stopped that action when they found a broken vial. At that time, they exited the work location and informed their supervisor. These events may indicate that workers are not sufficiently trained to recognize changed conditions and reevaluate assumptions and working conditions when conditions are not as analyzed.

The previous examples may indicate a more systemic weakness in job walkdowns and identification of hazards prior to development of the work package. In addition, worker actions to mitigate the hazards were not in accordance with CHPRC expectations, although the workers believed it was consistent with their training (see Safety and Health Training section).

Opportunity for Improvement: CHPRC should ensure that the workers recognize and understand changed conditions that need further analysis to ensure proper controls are implemented to eliminate or mitigate unanticipated hazards.

The Team reviewed Radiological Work Permits and work packages at PFP. As discussed in the Management Leadership section, the lack of radiological engineers with substantial PFP radiological engineering experience may have contributed to work packages being developed with weak, or lacking, controls. This lack of sufficient resources to perform adequate radiological hazard analysis may also be contributing to deficiencies in the radiological program discussed in the Hazard Prevention and Control section.

An expectation of DOE-VPP participants is that workers participate with safety experts in regular worksite inspections to identify health and safety concerns. CHPRC has a program of regular worksite surveillances by safety professionals. Additionally, there is a program of regular inspections by facility managers and members of EZAC. This program encourages inviting other workers to participate, as well as safety professionals. Although not required, records indicate that safety professionals participate in the facility managers and EZAC inspections almost 90 percent of the time.

In the past 2 years, awareness of beryllium issues at the Hanford Site has been significantly raised. There are extensive characterization efforts either complete or in progress, and CHPRC has been an active participant in these efforts. DOE-RL continues to work with the Hanford contractors to rebaseline the Beryllium Corrective Action Plan. CHPRC is currently following the site-wide Chronic Beryllium Disease Prevention Program (CBDPP) and the DOE interim guidance for beryllium characterization of buildings. For consistency, CHPRC has a management directive to assist all projects with guidance on how to implement the building characterization required by the new contract modification. Beryllium characterization reports are written after the sampling is completed and those reports are being made available on the CHPRC Intranet Beryllium Web site.

Beryllium Facility Assessments Forms have been completed for each building. This information helps to classify the buildings as Beryllium-Clean or Beryllium-Controlled Facilities. If a building has a Beryllium-Controlled Area, then a Beryllium Exposure Assessment and a Beryllium Work Permit are generated for employees to safely enter those areas. There are additional management directives and technical procedures for the various projects that are used to implement the general requirements of CBDPP. Beryllium wipe, bulk, and air samples are conducted to verify worker protection for beryllium hazards.

In addition, employees and managers from CHPRC participate in the Beryllium Awareness Group weekly CBDPP committee meetings, biweekly industrial hygiene beryllium update meetings by all projects, ICAP planning meetings, and subgroups under the direction of DOE-RL.

CHPRC performs hundreds of assessments across its projects every year. In some projects, managers and workers perform weekly walkdowns of work areas to identify issues and suggest improvements. In other projects the Team noted that inclusion of the workforce was not as consistent. D&D worksite inspection procedure requires that workers be included in those inspections, but this is not happening consistently. CHPRC should ensure worker participation in safety walkdowns and assessments to provide opportunities for the workforce to learn and apply observations garnered from these experiences to their work location. Workers then become safety advocates for improving their worksite or job function.

Opportunity for Improvement: CHPRC should ensure workers participate in safety walkdowns and assessments to provide opportunities for the workforce to learn and apply observations garnered from these experiences to their work location.

CHPRC tracks and trends a variety of items associated with performance and safety indicators. For example, injury metrics, contamination events, and occurrences are just a few of the many items that are tracked and evaluated. CHPRC has made a concerted effort to develop more leading indicators. Developing leading indicators will continue to be helpful as the culture

changes and matures. Other sites have found value by tracking near-miss events, accident precursors, or number and quality of safety suggestions to assure a continued improving culture, quest for excellence, and minimize complacency with the status quo.

CHPRC might find value in the DOE Pantex Plant's system for forecasting work. The DOE Pantex Plant in Amarillo, Texas, has developed a unique method of predicting potential safety issues. The document is called the Pantex Work Environment Forecast, and the method involves collection of information from varied sources and correlating that data to human performance, mechanical system performance, or other issues. Data included in the forecast are historical accident and injury data, leave usage, weather data, equipment failures, holidays or activities that might cause workers to be distracted, and other incident data. By correlating these data, managers can forecast what areas may present the most concern, and take action to train employees, prepare safety notes, and raise worker awareness of additional risks.

Conclusion

CHPRC has established programs for developing work packages and performing work. CHPRC can benefit by assuring that the implementation of improved worksite analysis procedural changes capture and institutionalize the logic for control selection. CHPRC needs to take advantage of worker input and concerns for hazardous energy controls to reduce the potential for inadvertent releases of hazardous energy. CHPRC has not yet 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 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.

Overall, the consensus of the Team's observations indicated that CHPRC's controls were effective throughout most of the projects. Very few injuries occur during performance of recognized high-hazard work, and there have been only two skin contaminations in the past 3 years. The use of engineered controls, such as ventilation systems, isolation tents, and gloveboxes, were utilized when appropriate. In addition, numerous examples of mockups were observed by the Team. WFMP created a mockup for drum retrieval simulation in order to improve and validate work methods and controls by the workers in drum retrieval. PFP required all operators involved in the glovebox reduction activities to use the glovebox mockup to increase their familiarity with using the various tools cutting the gloveboxes in a *clean* environment before using those techniques in a contaminated area.

However, the Team did identify some areas where CHPRC controls were not as effective. In most cases, the controls were insufficient due to an inadequate analysis, such as the electrical arc incident at U-Plant. CHPRC is aware of this potential weakness and is in the process of incorporating changes into the work control and planning process to address it.

The Team reviewed several work packages in D&D, WFMP, S&GRP, and PFP and attended numerous prejob briefings for ongoing or emergent work. The prejob briefs are the last opportunity, prior to starting work, for workers to clarify, question, or suggest changes to the work to be performed. Most of the prejob briefings were effective and included discussions of the prevalent hazards and controls. Worker involvement was apparent, included questions and clarifications on work evolution, and reminders of hold points and radiation protection requirements. In particular, the Team was impressed with the briefing for preparing the HC-3 glovebox removal from PFP room 232. The field work supervisor quizzed the workforce on the scope of work, responsibilities, responses to alarms, gathering points, and other emergency response topics. The workers were actively involved in the briefing and demonstrated a sound understanding of the hazards and controls involved in the work to be performed. This type of interaction is considered a superior method for prejob briefing by the Team.

In contrast, the review of radiological conditions by the RCT for that work was simply the reading of the Radiological Work Permit (RWP) to the group. The briefing would be more effective if the RCT emphasized key topics, such as changes in radiological hazards and controls, and identified the specific controls that are to be utilized in that particular work iteration. In addition, EPC prejobs typically had minimal worker involvement. While the EPC prejobs discussed the essential elements of work scope, hazards, and controls the observed lack of worker-input raised concerns with the Team that opportunities for improvement were not being achieved.

For D&D projects, CHPRC generally adopts an approach where all hazardous energy sources are removed from a building by identifying where the energy enters the building then opening an air gap between the building and the sources. This includes electrical power, air, steam, and water utilities, drains, or any other sources that can be identified. This effectively eliminates many hazards for workers that are being sent into the facility to remove piping systems and equipment in preparation for demolition. This process, known as *cold and dark*, has been a cornerstone of many effective remediation projects across the DOE complex, in particular Rocky Flats, Mound, and Fernald. CHPRC is using this cold and dark approach for a majority of the D&D work going on in the 100-K Area and the 200 East and West Areas. As already discussed in the Management Leadership section, the decision to not use the cold and dark approach for the U-Plant D&D work is presenting significant challenges and creating situations where workers are having inadvertent and accidental contact with hazardous energy sources.

CHPRC has incorporated beryllium controls into its work control process and has included Beryllium Work Permits (BWP) and associated hazard analyses in work packages for activities to be performed in beryllium-controlled areas. At PFP, more than 400 beryllium samples have been performed, and areas that were determined to contain beryllium at the action level were designated beryllium areas and posted accordingly. When work activities that could potentially disturb beryllium contamination were performed in those areas, the areas identified as beryllium areas were elevated to Beryllium Control Areas (BCA) requiring a BWP to be generated and appropriate beryllium controls to be implemented for any work in those areas. In addition, PFP is in the process of upgrading the Access Control Entry System (ACES) to identify beryllium areas and to verify that workers entering BCAs are beryllium-trained and qualified.

Use of PPE is specified in work documents, such as operating and maintenance procedures, technical documents, and the AJHA. In addition, PPE requirements to mitigate potential radiological exposures are specified in RWPs.

The initial glovebox reduction work performed late last year at PFP depended heavily on PPE and failed to consider additional engineered controls, such as cross ventilation in the tent. The reliance on PPE rather than engineered controls in the initial glovebox reduction work iterations may have been based on an assumption that additional engineering and administrative controls offered a diminishing return on investment, particularly if the work is of short duration and represented minimal exposure to employees. These assumptions subsequently proved false. While there were many lessons learned from the initial work iterations, several workers (including DOE Facility Representatives) described the initial controls as trial and error rather than as planned and controlled. As a result, the workers voided their RWP suspension limits 3 out of the first 4 attempts to perform the glovebox reduction activities. CHPRC has since recognized the importance of using appropriate controls. In addition, the involvement of the workers in the development of engineered controls and improved methods in the work steps has shown continued positive results. The glovebox reduction team is making significant improvements in engineered controls since those initial trials. Now, the glovebox reduction team is actively involved with developing the controls for the next series of gloveboxes to be removed. Working with engineering, industrial hygiene, and the radiological control engineers, they have redesigned the tent enclosure to include donning and doffing areas, developed a cross-ventilation system that ensures a continuous flow of air across the work area to reduce contamination exposure, and have reevaluated the tools to be used based on their cutting effectiveness and reduced level of contamination spread.

An example of those positive results was identified with the teams removing piping in the duct level at PFP. One team was tasked with removing a 26-inch vacuum line while a separate team was tasked with the removal of process piping. While both tasks were relatively similar, the individual teams utilized uniquely varying methods to achieve those tasks. The vacuum line removal team identified the four-blade cutting wheel as the tool of choice for the work while the process line removal team determined the band saw was most effective. Each method was evaluated and approved by the SMEs as appropriate in addressing the hazards. However, both teams were responsible for the resulting methods their teams employed. As a result, workers were comfortable with the approach and took personal ownership in the completion of the task.

A computerized Job Control System/Preventive Maintenance (PM) recall program is used by CHPRC to ensure extended equipment run time and avoid equipment failure. PM frequencies are established or revised based on several criteria: (1) specification and code requirements; (2) manufacturers' recommendations; (3) plant operating experience; (4) engineering requirements; and (5) equipment history. The PM backlogs reviewed by the Team were appropriate.

Prior to accessing radiological areas, workers must meet established training requirements that are validated through ACES to assure they are qualified to enter that radiological work area. The ACES also allows monitoring of workers' radiological exposure records. This data is then used to track personnel radiological exposures.

PRC-PRO-RP-40021, *Radiological Work Permits*, are used as an administrative mechanism to support the planning process for radiological work activities and provide written authorization to control entry into and support performance of radiological work. An RWP is generated if the work being performed is in a posted radiological area. In the RWP, radiological workers and RCTs performing work are given information about radiological hazards in the work area, the degree of coverage necessary from radiological control personnel, requirements for PPE, and limits at which work activities must be suspended.

The Team reviewed several RWPs as part of the review at PFP. Several issues were noted in the review that indicated potential weaknesses in the implementation of radiological controls.

Overall, the RWPs were very generic in nature. For example, all RWPs at PFP had the same limiting radiological conditions, depending on the type of radiological area, regardless of varying radiological hazards and expected upset conditions. Radiation area limiting radiological conditions were the same of 100mrem/hr, regardless if the general area dose rates were 0.5 mrem/hr or 15 mrem/hr. Radiological limiting conditions for contamination were set at the posting criteria for contamination and high contamination areas. Contamination levels only indicated whether the area was greater than, or less than, posting requirements rather than reflect survey results.

Another RWP, RWP Z-862 *rev 022*, was written to cover entries into the 242-Z area. 242-Z presents a special condition because contamination levels exceed the limits normally identified in the generic controls of greater than 20Kdpm/100 cm2. In order to permit work in 242-Z, the generic controls simply include a note for the high contamination limiting condition that states *Not to include 242-Z*. No other high contamination limit for 242-Z was determined that would indicate when workers should stop and reanalyze the conditions.

RWPs for entering airborne radioactivity areas with a Powered Air Purifying Respirator (PAPR) all had the same limiting radiological condition of greater than 160 DAC-hr if PAPRs were used. Again, the same limiting radiological condition was applied to RWPs with vastly different hazards and potentials to general airborne radioactivity. The same comment applied for entry with supplied air.

All these examples indicate a weakness in the radiological control process at PFP, particularly in the analysis being performed developing the RWPs. A review of PRC-PRO-RP-40021, *Radiological Work Permits*, identified that the procedure contains no direction on how to establish limiting radiological conditions in the RWP. This lack of definition appears to contribute to some of the control issues listed above. CHPRC needs to reevaluate and define its expectations of the intent of the RWP and the applicability of RWP assigned controls.

Opportunity for Improvement: CHPRC needs to reevaluate and better define its expectations regarding RWP control limits in its policy and guidance documents to ensure appropriate radiological control limits are assigned to the RWP.

The CHPRC emergency drill program is developed and implemented to ensure employees respond to emergency conditions quickly and safely to a level commensurate with their responsibilities for emergency response. It is conducted in accordance with PRC-PRO-EM-7647, *Emergency Preparedness Program Requirements*, which provides guidance for the Emergency Planning (EP) organization to develop, perform, evaluate, and grade EP drills. Facility personnel are trained to the Building Emergency Plan and facility hazards annually to ensure they understand how to respond to emergencies and abnormal conditions. Post-drill evaluations are held to receive participant and evaluator input, and a final report is issued. Lessons learned are included in the post-drill report and incorporated into other facility drills as appropriate.

The Team observations of the EP program indicated appropriate levels of control were in place. In particular, improvements in emergency preparedness and planning at WFMP were extensive. During an emergency event last year when a drum was punctured in the retrieval grounds and began venting, WFMP realized that existing procedures and drill scenarios used for training had not been adequate to prepare workers. The WFMP project manager asked workers to review the procedures, identify potential scenarios, and then as a group determine what actions they should take. Procedures were changed to reflect expected response actions, new training scenarios were developed, and those scenarios have been used regularly to drill workers in the WFMP. Workers and managers alike had significantly increased confidence in their ability to respond to the range of probable emergency scenarios.

In addition, the HSS Office of Emergency Management Oversight performed a review of specific portions of the emergency management program at the Hanford Site between October and December of 2009. The results of that review concluded that:

Overall, based on the results of the elements reviewed, the Hanford emergency management program provides reasonable assurance that Hanford site workers and the public will be adequately protected following a significant site event.

This conclusion is based on several factors, including an appropriate program foundation established through the Emergency Planning Hazard Assessments, completed and ongoing

programmatic improvements, the expertise of emergency management program managers and staff, and the self-identification of areas that need further effort.

Occupational health services, including health maintenance examinations, medical surveillance examinations, staffing of field first-aid stations, and medical consultation, are provided by AMH/CSC under contract through DOE-RL. Assistance in injury case management was formerly provided, but DOE-RL recently directed AMH/CSC to provide only first-aid treatment for injured workers, with any other injury treatment to be provided by offsite medical service.

AMH/CSC is responsible to establish a compliant and comprehensive occupational medicine program for workers employed at CHPRC that work on a DOE site for more than 30 days in a 12-month period or are enrolled for any length of time in a required medical or exposure monitoring program. CHPRC uses the EJTA process to notify the occupational medicine provider of those workers.

AMH/CSC provides medical services for all site workers along with injury case management services including interaction with the offsite medical providers, the employee, and managers during the recuperation period following a job-related injury or illness. AMH/CSC occupational health specialists are expected to make worksite visits to become familiar with the hazards and to assess employee work conditions related to specific incidents that involve an occupational injury or illness.

CHPRC uses the EJTA process to identify employees with potential or actual exposures who require enrollment in specific medical-monitoring programs; e.g., lead, asbestos, or beryllium. The employee's manager, with input from the employee, the facility/project industrial hygienist, and the safety representative, completes the EJTA. The EJTA identifies the physical requirements of the employee's job, potential exposures to hazardous chemicals/materials, and assignment to special functions. Once established, the EJTA is reviewed periodically, and updated if necessary, for each employee.

CHPRC managers expressed some concern regarding work restrictions identified on worker injury reports. In many cases, the restrictions being identified by AMH/CSC personnel were nonspecific and did not relate to worker duties and tasks identified on the EJTA. CHPRC needs to work with AMH/CSC staff to implement mechanisms that link job restrictions identified on the injury report to tasks or duties identified on the EJTA.

Opportunity for Improvement: CHPRC needs to work with AMH/CSC staff to implement mechanisms that link job restrictions identified on the injury report to tasks or duties identified on the EJTA.

Another concern raised by workers was related to the level of care provided by AMH/CSC. Workers expressed concern that the 200-West Area clinic would be providing only first-aid level of care. Review of the AMH/CSC Web site indicates that the 200-West Area clinic would only provide first-aid level of care on the normal site, "Off Friday," and limited hours on weekends. CHPRC workers, in some cases, are working shifts with some facilities being staffed 24/7. In those cases, workers were concerned that their remote location would provide significant challenges to getting them to an appropriate care facility. The site does have a 24/7 fire department with emergency medical staff. CHPRC should work with HAMTC, DOE-RL,

AMH/CSC, and MSA to identify worker concerns with emergency medical response capabilities and ensure their concerns are adequately addressed.

Opportunity for Improvement: CHPRC should work with HAMTC, DOE-RL, AMH/CSC, and MSA to identify worker concerns with emergency medical response capabilities and ensure their concerns are adequately addressed.

Conclusion

CHPRC has encountered several challenges related to hazard controls since the transition to the new contract. From those challenges, CHPRC is working to resolve identified weaknesses. The overall effectiveness of controls is generally demonstrated by the lack of injuries during performance of hazardous work and the absence of skin contaminations from work in high-contamination areas. Based on the Team's review, improvements are heading in the right direction, but need time to ensure improvements are fully implemented and meet the expectations of a DOE-VPP Star participant in the Hazard Prevention and Control element.

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.

Training and qualification programs are well established so that CHPRC employees are appropriately trained to recognize the hazards of the work environment and protect themselves and their coworkers. Administrative Procedure PRC-PRO-TQ-40164, *Personnel Training and Qualification*, describes the training process and ensures CHPRC workforce is appropriately trained to work effectively and safely. The process as defined and implemented is systematic and covers the needed knowledge, skills, and abilities to perform tasks competently and safely. It applies to all employees and all aspects of CHPRC operations and projects.

CHPRC supervisors and managers understand their safety and health responsibilities and know how to effectively carry them out. CHPRC supervisors and team leads receive the same safety and health training as their employees, but some training has greater depth to reflect the added responsibility of the position. Other training courses offered to supervisors and team leads include:

- Supervisor's Guide to Reporting, Investigating, and Managing Events;
- Management Assessments;
- Electrical Safety;
- Risk Evaluation;
- Root-Cause Analysis;
- Hazard Recognition;
- Human Performance Fundamentals Certification;
- Leadership Essentials;
- Safe Drug-Free Workplace;
- Resolving Employee Concerns;
- Beryllium Manager/Supervisor Training;
- Environmental Regulations at Hanford;
- Standards for Electrical Safety;
- Safety Leadership;
- Critique Leadership; and
- ISMS and Work Planning Team Leader.

First-line supervisors must have a combination of entry-level education, experience, site access, job-specific orientation reading, and required training as assigned in their individual training plans. They also complete a Field Work Supervisors course, which consists of written examination and oral boards and certification. Field work supervisors with authority and responsibility for radiological work are required to complete the *Radiological Control Manual Training for Managers* course. In addition to the same basic safety and health training as supervisors/team leads, the managers complete *Safety Leadership* training that includes accident investigation, ISMS, worker/team roles in work planning and prejob and postjob reviews.

The Team interviews with managers and supervisors and a review of training documents and courses demonstrated that they participate in monthly safety meetings and several formal training

and workshop discussions regarding their safety and health program responsibilities. It was evident that they understood their safety and health responsibilities.

A program gaining support in general industry is the Safety-Trained Supervisors (STS) Program. This program provides supervisors with a third-party certification by the Board of Certified Safety Professionals through the Council on Certification of Health, Environmental, and Safety Technologists. STS certification establishes a minimum competency in general safety practices. To achieve the certification, candidates must meet minimum safety training and work experience and demonstrate knowledge of safety fundamentals and standards by examination. Those holding the STS certification must renew it annually and meet recertification requirements every 5 years. This program has proven effective at other sites in helping supervisors recognize potential unsafe acts and conditions and make improvements in safety. CHPRC currently has 33 people certified STS from the previous contractor and is reimbursing them for the annual costs to maintain that certification. CHPRC has not encouraged other supervisors to pursue this certification. CHPRC should consider broader support for STS certification as a means of garnering additional safety improvements.

Opportunity for Improvement: CHPRC should consider encouraging supervisors and managers to pursue STS certification.

CHPRC has a comprehensive training process for all employees. Most of the safety and health training is provided by MSA at the Volpentest Hazardous Materials Management and Emergency Response (HAMMER) training facility and consists of classroom training, computer-based training (CBT), and on-the-job training (OJT). New CHPRC and subcontractor employees complete the Hanford General Employee Training (HGET), which provides the basic safety and health training. The employee must take a written test and pass it with minimum score of 80 percent. They must also complete CGET, which provides safety and health information specific to CHPRC operations and pass it with minimum score of 80 percent. The completion of HGET/CGET is required for issuance of the site-access badge. The employees must complete the HGET/CGET refresher annually to retain their badges. The training modules for the HGET and CGET are comprehensive and contain good discussion of VPP, ISMS, BBS and Human Performance Improvement. Similar to other Hanford contractors, CHPRC uses an additional module in the HGET annual refresher as a 10-question worker cultural survey.

Some recent incidents may indicate weaknesses in worker training related to abnormal, unexpected, or unplanned situations. As discussed in the Worksite Analysis section, in one case, an asbestos worker used duct tape to cover electrical conductors to make it stable for his coworker to exit an area where an electrical arc had been observed. In another case, workers moved mercury containers, which were stable and should not have been disturbed without further planning and analysis. Workers in both cases erroneously thought they were acting in accordance with their training. CHPRC should review worker training to ensure it effectively prepares the workers to deal with conditions that were not planned or expected.

Opportunity for Improvement: CHPRC needs to review worker training to ensure it effectively prepares the workers to deal with conditions that were not planned or expected.

In addition to HGET and CGET, the employees are provided additional safety and health training that focuses on hazards and controls specific to their job functions. Most of the training is provided by HAMMER and is CBT. There are some classroom courses led by instructors,

some of whom are from the CHPRC Training Organization. Some courses, such as *Radiological Workers Practical*, have hands-on demonstration of proficiency component. Although most training is CBT, many workers at the site do not have consistent, convenient access to computers at their job sites. Computer access limitations may hinder their awareness of upcoming or expiring training or their ability to complete the training. CHPRC should ensure workers have the computer access needed to complete CBT courses and to access e-mail notifying them of expired training. Where it is not practical to provide better computer access, CHPRC should ensure supervisors effectively monitor and communicate upcoming training needs to the workers and provide them the time necessary to complete the training at a suitable location.

Opportunity for Improvement: CHPRC should ensure workers have the computer access needed to access e-mail notifying them of expiring training and to complete CBT. Where it is not practical to provide better computer access, CHPRC should ensure supervisors effectively monitor and communicate upcoming training needs to the workers, and provide workers the time necessary to complete the training at a suitable location.

The OJT process is well defined and effectively implemented. Newly hired or reassigned employees are directly supervised by a qualified worker. OJT consists of classroom training followed by examination and performance testing by an SME. Following successful completion of OJT, the employee is issued a *qual card*, which expires in 2 years. The employee must requalify before expiration of training to perform the work, which required an OJT.

CHPRC has an effective process for determining the specific training requirements for each employee. Integrated Training Electronic Matrix (ITEM) is the main system through which employee training is managed. ITEM has the training plans for most of the job categories set up in training templates. For each new or reassigned employee, the manager completes the EJTA, which identifies the job hazards for the employee. The EJTA information is put in the EJTA database maintained by AMH/CSC. The manager uses EJTA and the training template to prepare the individual training plan for the employee. The manager notifies the training coordinator to schedule training for the employee. The training coordinator puts the individual training record in ITEM and also schedules the training. The manager is also required to perform an annual review of individual training plans to ensure accuracy and modify as necessary.

All training completion records are maintained by the HAMMER records office in ITEM. Training and qualification records are accessible by the managers and training coordinators. Training coordinators are assigned to each project area. These training coordinators prepare regular reports and inform the managers and employees of the training that will be expiring in the next 90 days and 60 days. CHPRC is working to automate notification to managers and supervisors of upcoming training expiration. The employees and managers are responsible for ensuring that the employees take the training prior to its expiration.

As a part of prejob briefing checklist there is a check point that requires the supervisors to verify worker training and medical monitoring. The prejob briefings attended by the Team showed that the supervisors were ensuring that the employee training was current for the jobs they were assigned.

While the Team review of the training records indicated that training of most employees is current, the Team did find three cases where the HGET/CGET had expired: over

2 months for one employee, and 1 month for two other employees. The training manager contacted the managers of these employees, and the managers agreed to have the employees complete HGET/CGET. The current system places the responsibility of ensuring that the employee training is current on the manager; and in these cases, the managers failed to do so even though the training organization had informed the managers 90 days and 60 days in advance of expiration of training. CHPRC should review the process linking HGET/CGET training to site access and ensure that employees complete their annual HGET/CGET prior to expiration.

Opportunity for Improvement: CHPRC should review the process linking HGET/CGET training to site access and ensure that employees complete their annual HGET/CGET prior to expiration.

Delinquency in training was also identified as a concern by the managers within the S&GRP. In order to increase the awareness of overdue training delinquency, the training staff at S&GRP provides detailed reports of employee delinquency trends and employee delinquencies by managers. S&GRP managers reported delinquent training has reduced from 19 percent to 4.9 percent due to visibility and trending analyses. However, conducting these activities uses resources, which could be better utilized in other training activities. CHPRC should institute a system whereby the training delinquencies and delinquency rates are automatically generated using the training data in ITEM.

Opportunity for Improvement: CHPRC should develop a system that automatically generates the delinquencies and delinquency rates using the training data ITEM.

The Team review of the records found that the subcontractors have been effective in verifying that their workers complete required training. However, there were some challenges in training at PFP. For example, in support of the ARRA work scope, CHPRC more than doubled its RCT staffing levels. Many of the new RCTs had no previous radiological experience. The new RCTs went through 3 months classroom training followed by OJT. The Team reviewed a training qualification matrix for the RCTs. The Team found that most RCTs had not completed or had not requalified in a significant number of the items on the matrix (see Management Leadership section).

At PFP, there was some confusion on who was allowed to survey a visitor being escorted. An RCT told an escort he can survey a visitor, but the Supervisor stated this is not allowed. It appeared that additional training is needed in this area. In addition, the Team noted some minor errors in the General Employee Radiological Training (GERT). For example, the quiz defines the dose limit for nonradiological worker as 100 mrem. Title 10 CFR 835 does not use the term *nonradiological worker*. Title 10 CFR 835 establishes 100 mrem as the dose limit for members of the general public, and 5,000 mrem for general employees. Title 10 CFR 835 does require training for employees expected to exceed 100 mrem in a calendar year. CHPRC should review and clearly state the protocols for the radiological survey of escorted visitors and work with MSA to make GERT consistent with the requirements of 10 CFR 835.

Opportunity for Improvement: CHPRC should review and clearly state the protocols for the radiological survey of escorted visitors and work with MSA to make GERT consistent with the requirements of 10 CFR 835.

A positive development noted by the Team was that the HAMTC Safety Representatives have been trained in accident investigations, which increases CHPRC capability in this vital safety area.

The Team observed a portion of the class for managers and mentors in Human Performance Improvement. Even though the class was taught at HAMMER, the instructors were from the CHPRC Training organization. A needs analysis was conducted prior to the class, which was targeted for the CHPRC managers and mentors. The class included video examples with student participation in teams. The technical content was appropriate, the instructors were knowledgeable of the subject, and the attendees participated actively. As a last part of the course, the instructors spent a good deal of time seeking class input for what were the strengths and weaknesses of the course so that it could be improved in the future.

Conclusion

CHPRC has a well-established training and qualification program that ensures workers are appropriately trained to recognize hazards and protect themselves and coworkers. The CHPRC training program helps managers, supervisors, and employees to understand the established safety and health policies, rules, and procedures to promote safe work practices and minimize exposure to hazards. Some cases were identified where workers' training to recognize changed or unexpected conditions has not been effective and must be addressed to achieve DOE-VPP Star status. There are also opportunities to improve tracking and completion of training and requalification.

VIII. CONCLUSIONS

Since the new Plateau Remediation Contract went into effect in October 2008, CHPRC has faced several major challenges. Changes in the structure of the organization, the decision to pursue DOE-VPP Star status for the entire organization rather than smaller parts, the infusion of ARRA funds and the resultant doubling of the workforce, aggressive target dates for completion of ARRA projects, and now the prospect of large-scale workforce reductions have all created distractions that are causing reductions in the overall safety culture. That does not mean the site or the workers are unsafe, but the overall focus and drive toward company-wide safety excellence has not yet achieved the levels expected of a DOE-VPP Star site.

The Team is concerned that a combination of the overreliance on supervisors understanding of the OSHA interpretation on restrictions versus accommodations, nonspecific work restrictions that are not tied to specific worker duties, and the reference to TRC and DART case rates as an element of contractor award fee may be masking an upward trend in TRC and DART case rates. Even with the additional cases that should have been recorded on the OSHA 300 records identified by DOE-RL, the TRC and DART case rates are still 25 percent below the comparison industry average.

CHPRC managers and workers alike are committed to reaching DOE-VPP Star status, and there are many improvements being made. The Team believes those changes, primarily contained in the IPIP and ICAP are moving CHPRC in the right direction, but require time to demonstrate effectiveness and become fully integrated into the safety culture. More effective communication throughout the organization, and continuous reinforcement of *production through safety* and *if we can't do it safely, we won't do it*, are essential to achieving the necessary cultural improvements. While the vast majority of workers believed in the CHPRC commitment to safety, the belief by a small segment of the workforce that they cannot raise safety issues without fear of retaliation, the associated distrust of some managers and the lack of understanding of worker rights under 10 CFR 851 must be addressed and resolved by CHPRC managers.

CHPRC has effective tools for performing Worksite Analysis, but needs to ensure those tools are used and include worker input and concerns. Everyone (managers, supervisors, and workers alike) must recognize where they are making assumptions regarding locations of hazards or how those hazards are controlled. Those assumptions must be analyzed, eliminated, and validated controls put in place.

The overall effectiveness of controls is generally demonstrated by the lack of injuries during performance of hazardous work and the absence of skin contaminations from work in high contamination areas. Improvements are heading in the right direction, but need time to ensure improvements are fully implemented.

Training for all personnel was effective, but delinquencies and expired qualifications may be creating additional challenges for work assignments, particularly in radiological controls. The few cases where workers' HGET/CGET had expired but workers were still afforded site access, indicate a potential weakness that needs to be corrected. Additionally, training to ensure workers recognize unanticipated hazards or unplanned situations and react appropriately by backing out and stopping work must be reinforced.

Throughout this report, the Team has identified opportunities for improvement. Those opportunities, highlighted in Table 1, indicate areas the Team believes are critical for CHPRC to

achieve DOE-VPP Star status. The Team recognizes that CHPRC has made significant progress toward achieving that status for the Company as a whole. Changes to the program scope and structure under the new contract have been more extensive than originally anticipated. As such, the Team is recommending that CHPRC be moved from the transitional status and be admitted to DOE-VPP as a new applicant at the Merit level. As a Merit participant, CHPRC is entitled to assistance from HSS in addressing those areas identified in this report as opportunities for improvement and annual progress assessments.

Appendix A: Onsite VPP Assessment Team Roster

Management

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