Washington Closure Hanford, LLC

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
March 23-April 3, 2009

U.S. Department of Energy
Office of Health, Safety and Security
Office of Health and Safety
Office of Worker Safety and Health Assistance
Washington, DC 20585

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 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. Assessments are now more performance based and are enhancing the viability of the program. Furthermore, 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, associates, and DOE.

Requirements for DOE-VPP participation are based on comprehensive management systems with associates actively involved in assessing, preventing, and controlling the potential health and safety hazards at their sites. DOE-VPP is designed to apply to all contractors in the DOE complex and encompasses production facilities, research and development operations, 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 contractors and subcontractors 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 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 associates 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. DOE will provide the opportunity for contractors to work cooperatively with the Agency to resolve health and safety problems. Each approved site will have a designated DOE staff person to handle information and assistance requests from DOE contractors.

This report summarizes the results from the evaluation of Washington Closure Hanford, LLC (WCH), at the Hanford Site during the period of March 23-April 3, 2009, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding WCH's participation in DOE-VPP as a Star site.

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ABBREVIATIONS AND ACRONYMS

AED	Automated External Defibrillator
AMH	AdvancedMed Hanford
ALARA	As Low As Reasonably Achievable
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
ConOps	Conduct of Operations
CPR	Cardiopulmonary Resuscitation
CRATER	Compton Ratio Analysis for Testing Environmental Radioactivity
D&D	Decontamination and Decommissioning
DART	Days Away, Restricted or Transferred
DOE	U.S. Department of Energy
EJTA	Employee Job Task Analysis
EP	Emergency Preparedness
ERDF	Environmental Restoration Disposal Facility
ESHI	Eberline Safety and Health Incorporated
HAMTC	Hanford Atomic Metal Trades Council
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations/Emergency Response
HGET	Hanford General Employees Training
HIM	Hazard Identification and Mitigation document
HSS	Office of Health, Safety and Security
IH	Industrial Hygienist
ISMS	Integrated Safety Management System
IWCP	Integrated Work Control Process
JHA	Job Hazard Analysis
LSIT	Local Safety Improvement Team
MSDS	Material Safety Data Sheet
NAICS	North American Industry Classification System
NPL	National Priorities List
OJT	On-the-Job Training
OSHA	Occupational Safety and Health Administration
PI	Performance Indicator
PM	Preventive Maintenance
POD	Plan of the Day
PPE	Personal Protective Equipment
RCCP	River Corridor Closure Project
RCT	Radiological Control Technician
RL	Richland Operations Office
RWP	Radiological Work Permit
SHIP	Safety and Health Improvement Plan
SSC	Systems, Structures, and Components
SSHASP	Site-Specific Health and Safety Plan
SSNF	Suspected Spent Nuclear Fuel
STS	Safety Trained Supervisor
TAT	Training Assignment Tool
Team	Office of Health, Safety and Security VPP Team

TPD	Training Position Description
TRC	Total Recordable Case
TRIS	Training Records Information System
VPP	Voluntary Protection Program
WCH	Washington Closure Hanford, LLC

EXECUTIVE SUMMARY

Washington Closure Hanford, LLC (WCH), a limited liability company owned by URS Corporation-Washington Division, Bechtel National, Inc., and CH2M Hill Constructors, Inc., was awarded the prime contract to manage the River Corridor Closure Project (RCCP) in March 2005. In addition to the partner companies, Eberline Safety and Health Incorporated (ESHI) was named as a preselected prime subcontractor, and is included in the scope of the WCH application. The River Corridor is approximately 210 square miles (546 square kilometers) of the Hanford Site, adjacent to the Columbia River. The project is scheduled to be completed in 2013 and cost $2.2 billion. In that time, WCH will decontaminate and remove 486 facilities, close or remediate 370 waste sites, cocoon 4 reactors, and dispose of about 4 million tons of contaminated material.

Total Recordable Case (TRC) rates and Days Away, Restricted or Transferred (DART) case rates for WCH and RCCP as a whole have been relatively constant over the past 3 years and are a small fraction of the comparison industry average. The low rates for the past 3 years clearly meet the expectations for participation in the Department of Energy (DOE) Voluntary Protection Program (VPP).

The management team at WCH has been exemplary in its demonstration of leadership and commitment to safety. Over the past 2 years, WCH has progressed from an organization that was perceived by the workforce as valuing production over safety to an organization that values production because of safety. The commitment to provide the necessary resources, the actions that demonstrate the personal leadership and involvement in safety, and the relentless focus on doing the job right are evident.

Employee ownership is strongly rooted across the WCH organization. Managers and employees have worked together to develop open lines of communication to identify and promote safety and health responsibilities, goals and expectations, to identify potentially hazardous conditions, and collaborate to mitigate recognized and potential hazards.

WCH has effective methods and processes in place to identify hazards associated with RCCP. Workers demonstrated the ability to recognize new or unexpected hazards and to pause or stop work when those conditions were encountered. WCH should be able to gain significant improvement in its work planning process by modifying the planning process to perform and document more detailed analysis of those identified hazards. The ability to perform and document detailed hazard analysis has been demonstrated through special studies and lessons learned and should be incorporated into the work planning process.

WCH has identified and implemented appropriate controls to ensure a safe workplace. Potential hazards and control procedures are well communicated and seem to be understood by the employees.

Safety and health training continues to be a top priority at WCH. Part of each supervisor's performance evaluation is achievement of ontime training for each employee under his/her supervision. The identification of various required training courses is rigorous and on target to meet legal and performance standards. The courses are effective in building safety performance and implementing a culture of safety.

Based on this assessment, the Office of Health, Safety and Security DOE-VPP Team (Team) is recommending that WCH be admitted to DOE-VPP at the Star level.

The standard for Star status is not perfection, but rather, in addition to an excellent safety record, managers and workers are dedicated to and effectively pursuing continuous improvement and excellence in safety performance. Consistent with that goal, the Team identified a number of opportunities for improvement. These opportunities reflect those areas where WCH can further improve its performance (see table 1). While no formal action plan is required to address them, WCH is expected to consider and specifically address the opportunities for improvement in its annual status reports.

TABLE 1

OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	**Page**
WCH should provide measurable targets for as many actions in SHIP as possible as a means of identifying successful achievement of the goal.	**7**
WCH should ensure wider and more frequent dissemination of SHIP and monthly status updates.	**7**
WCH should consider additional engineering studies of stored energy systems to ensure equipment design, operation, and maintenance support continued safe operation in RCCP.	**15**
WCH should revise instructions for preparation of JHAs to clearly define and document the analysis that links the hazard identification to the selected set of controls. After revision of the procedure, WCH should conduct training for all work planning team members on the process.	**18**
WCH should ensure that EJTAs are reviewed and updated when workers change work assignments.	**22**
WCH should ensure that all TPDs are up to date and that all workers have completed required training.	**25**

I. INTRODUCTION

Washington Closure Hanford, LLC (WCH), a limited liability company owned by URS Corporation-Washington Division, Bechtel National, Inc., and CH2M Hill Constructors, Inc., was awarded the prime contract to manage the River Corridor Closure Project (RCCP) in March 2005. In addition to the partner companies, Eberline Safety and Health Incorporated (ESHI), was named as a preselected prime subcontractor, and is included in the scope of the WCH application. The River Corridor is approximately 210 square miles (546 square kilometers) of the Hanford Site, adjacent to the Columbia River. This area is divided into four major subareas: the 100 Area, comprised of shutdown plutonium production reactors and support facilities; the 300 Area, comprised of reactor fuel fabrication, research, and support facilities; the 400 Area, which includes support facilities for the Fast Flux Test Facility and Infrastructure Program; and the 600 Area, comprised of mostly vacant land. The 100 and 300 Areas are on the U.S. Environmental Protection Agency's National Priorities List (NPL) and are 2 of the 3 open NPL sites at the Hanford Site. The project is scheduled to be completed in 2013 and cost $2.2 billion. In that time, WCH will decontaminate and remove 486 facilities, close or remediate 370 waste sites, cocoon 4 reactors, and dispose of about 4 million tons of contaminated material.

RCCP is organized around three major project areas to complete the work:

- D4 Project – deactivates, decommissions, decontaminates, and demolishes retired nuclear and support facilities;

- Field Remediation Project – cleans up and removes materials in waste sites and burial grounds; and

- Waste Operations Project – designates, transports, treats and disposes of waste, and manages the Environmental Restoration Disposal Facility (ERDF).

In addition, Mission Completion (formerly End State and Final Closure Project) ensures that remediation under RCCP is completed to the standards of the Tri-Party Agreement and that the land is suitable for transfer to long-term stewardship.

Successful cleanup of the River Corridor will allow the land to be available for other uses (e.g., providing opportunities for public access to key recreational areas, protecting cultural resources, and shrinking the footprint for active Hanford cleanup operations to approximately 75 square miles (185 square kilometers). Key challenges include the need to remove and process buried high-activity wastes; deactivation, decontamination, decommissioning, and demolishing excess facilities; and isolating the reactor buildings while existing source terms decay away (Interim Safe Storage). Per its contract with the Department of Energy (DOE), WCH performs approximately 35 percent of the work at the site with the remaining 65 percent divided among various subcontractors, including small and disadvantaged businesses.

WCH successfully completed Phase II verification of its Integrated Safety Management System (ISMS) in November 2007. Following that, WCH began working toward DOE Voluntary Protection Program (VPP) Star status and submitted its application for participation in DOE-VPP in October 2008. After review and comment on the application by the Office of Health, Safety and Security (HSS) VPP Team (Team), the application was accepted and the onsite assessment was scheduled for March 23-April 3, 2009.

During the review, the Team conducted work observations at work sites within RCCP. Work observed included field remediation activities, decontamination, deactivation and decommissioning, demolition, and disposal activities. The Team also attended meetings of various committees, observed training sessions, and performed extensive reviews of documents, including work plans, procedures, hazard analyses, lessons learned, special reports, and a variety of management assessments. Additionally, the Team had contact with over 100 workers, supervisors, and managers from both WCH and subcontractors. This report documents the results of that review.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (WCH)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	Total Recordable Case (TRC) Incidence Rate	DART* Cases	DART* Case Rate
2006	1,464,258	4	0.55	1	0.14
2007	1,477,498	5	0.68	1	0.14
2008	1,502,804	3	0.40	0	0.00
3-Year Total	4,444,560	12	0.54	2	0.09
Bureau of Labor Statistics (BLS-2007) average for NAICS** Code #56291 Remediation services			4.8		2.6
Injury Incidence/Lost Workdays Case Rate (WCH Subcontractors and Vendors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2006	304,153	0	0.00	0	0.00
2007	481,736	2	0.83	0	0.00
2008	545,856	4	1.47	1	0.37
3-Year Total	1,331,745	6	0.90	1	0.15
Bureau of Labor Statistics (BLS-2007) average for NAICS** Code # 56291 Remediation services			4.8		2.6

Combined Injury Incidence/Lost Workdays Case Rate (WCH, Subcontractors and Vendors)					
Calendar Year	Hours Worked	TRCs	TRC Incidence Rate	DART* Cases	DART* Case Rate
2006	1,768,411	4	0.45	1	0.11
2007	1,959,234	7	0.71	1	0.10
2008	2,048,660	7	0.68	1	0.09
3-Year Total	5,756,305	18	0.62	3	0.10
Bureau of Labor Statistics (BLS-2007) average for NAICS** Code # 56291 Remediation services			4.8		2.6

* Days Away, Restricted or Transferred

** North American Industry Classification System

TRC and DART rates for WCH and RCCP as a whole have been relatively constant over the past 3 years and are a small fraction of the comparison industry average. The increasing trend in the TRC rate for subcontractors was identified by WCH and was attributable to one subcontractor. WCH notified that subcontractor of its negative trend, but the subcontractor was not successful in making necessary changes. WCH subsequently did not reinstate this subcontractor. The low rates for the past 3 years clearly meet the expectations for participation in DOE-VPP.

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 clearly communicated policies and goals, clear definition and appropriate assignment of responsibility and authority, adequate resources, and accountability for both managers and workers. Finally, managers must be visible, accessible, and credible to employees.

WCH has compiled a strong team of experienced managers. All the senior managers have extensive experience in DOE projects, including construction, demolition, facility operations, and environmental remediation. In addition, their experience covers the wide variety of nuclear and chemical hazards being addressed in RCCP. WCH assumed management of RCCP in 2005. For the first 2 years, WCH faced several cultural challenges. Although WCH was meeting its remediation goals, it was experiencing many events and occurrences. DOE, along with the Washington Department of Ecology and the Environmental Protection Agency, was losing faith that WCH could perform the mission, and WCH received an approximate $1,400,000 fine for failure to comply with environmental agreements. An employee opinion survey in 2007 clearly identified work planning, trust and respect, management teamwork, communications, and the fear of retaliation as areas needing to be addressed.

Recognizing the challenges, WCH appointed a new president. Over the course of the ensuing months, several other managers were replaced, which reflected a significant change in management style. Changes included the following expectations from the company president: managers would be present in the field more frequently; the employee concerns program would increase from a single, part-time employee to two full-time employees; and safety was as important as cost and schedule.

These expectations could not have been more firmly reinforced than when the new president decided to delay the ISMS Phase II verification. That verification was a critical milestone for WCH. The decision to delay the verification, limit high hazard activities, and refocus the company on effective implementation of ISMS was a bold move. This delay extended WCH's ISMS Phase II verification beyond the timetable established in the WCH contract. As a result, DOE imposed a significant fee reduction.

Over the next 6 months WCH took extensive corrective actions. The DOE Richland Operations Office (RL) then conducted the ISMS Phase II verification from October 29-November 7, 2007. That review documented the significant changes WCH was able to accomplish. The Team particularly noted that WCH implementation of management walkthroughs was instrumental in improvements in operations. The Team also noted the compensatory measure of reviewing and grading surveillances and assessments. Surveillances and assessments that did not meet quality expectations were returned to the assessor for additional work.

The increased visibility of managers in the field was consistently noted by employees interviewed by the Team. The senior management team was repeatedly praised by workers for its leadership and participation, and the change that has taken place over the past 2 years. This

visibility has contributed to an improved atmosphere of trust and commitment between workers and managers. Other evidence of this improved relationship includes the increased use of the Local Safety Improvement Team (LSIT) logbooks to identify workers' concerns, the reduced use of the WCH Employee Concerns Program, and the increased communication and awareness between workers and managers on employee concerns. Although there remain a few pockets of distrust, continued management attention, presence, and action to address workers' concerns should ease those remaining issues.

Managers have not only increased their presence in the field, but have been intentional in their efforts to lead by example. All senior managers interviewed, from the company president down, were active participants in safety promotion efforts. The recent VPP Passport has been particularly successful. In order to successfully complete the VPP Passport, managers must be signed off on management activities by the local LSIT team chairs. This gives the LSIT an opportunity to provide feedback directly to managers, as well as increasing manager visibility and participation.

WCH has done an excellent job of ensuring adequate resources are provided for safety and health. WCH ensures that there is a site safety representative assigned to each area and subcontractor. In addition, those safety representatives are expected to continue their professional development in safety. Professional development includes obtaining degrees in safety and pursuit of Associate Safety Professional and Certified Safety Professional certification. Each of these processes is supported by WCH through tuition reimbursement and payment of course and examination fees.

In addition to the safety professional development, WCH has made significant investments in supervisors and middle managers to complete the Safety Trained Supervisor (STS) program, an Occupational Safety and Health Administration (OSHA) recognized safety training program. Through this process, supervisors from both WCH and subcontractors are made more aware of OSHA standards and requirements and how they can work to improve their workplaces. Once again, WCH purchases training materials, pays for training classes, and encourages supervisors to actively pursue STS certification. In an effort to ensure a cadre of replacements is available, WCH has also allowed nonsupervisory personnel to pursue the STS certification. This program has also significantly assisted in WCH's oversight of its numerous subcontractors by placing knowledgeable, safety-trained individuals onsite with each certified STS employee.

WCH has also been very successful in providing resources for safety promotions and awards. WCH managers consistently recognized the value of these as an investment in the workforce. Comparison of WCH's budget with other DOE-VPP participants evaluated over the past 3 years has shown a significant correlation to the per capita budgets and workforce involvement and trust. WCH's budget for safety promotions and recognition is consistent with other sites that demonstrate the highest levels of performance.

WCH managers do not rely solely on subjective assessments to measure and evaluate their safety and health performance. Each month the senior management team meets with the company president to discuss specific Performance Indicators (PI) that address the broad suite of safety and production goals. Each PI is reviewed for trends, proposed actions are discussed and agreed upon, and effectiveness of previous actions is reviewed. These PIs comprise a range of both lagging and leading indicators. Additionally, the management team discusses new potential PIs, what information those indicators might provide, and potential undesired consequences or

perceptions to which those indicators might contribute. An interesting indicator used by WCH is the percent of issues internally identified. This indicator attempts to measure the quality of self-assessment and observation activities by comparing issues identified by external sources with those already identified internally. For the past 12 months, an individual PI has been averaging over 75 percent and trending upward, thus indicating an improvement in the ability of WCH to perform critical self-assessments.

Each year WCH develops a Safety and Health Improvement Plan (SHIP). This plan is prepared by the safety and health department with input from LSIT. SHIP considers the contractual performance goals from RL, as well as performance against the internal performance indicators. SHIP contains many specific actions, such as publication of the Hazard Identification and Mitigation document (HIM), issuance of awareness communications, and developing assessment schedules. The plan does not include any specific performance targets that might be used to determine success of individual actions or efforts. An opportunity to improve SHIP would be to identify specific performance targets, such as 80 percent of supervisors and managers completing STS certification by the end of the fiscal year, 90 percent completion of scheduled internal assessments, or other applicable targets.

Opportunity for Improvement: WCH should provide measurable targets for as many actions in SHIP as possible as a means of identifying successful achievement of the goal.

Not all managers and supervisors were aware of SHIP, nor were they aware of how their actions could contribute to that plan. LSIT reviews SHIP and prepares and publishes monthly updates on the internal Web site. Increased awareness of SHIP with monthly updates is an essential element of ensuring the plan is used to the greatest effect. WCH should consider inclusion of monthly SHIP status updates in the senior management performance indicator briefings, and senior managers should ensure SHIP is regularly reviewed with their staff.

Opportunity for Improvement: WCH should ensure wider and more frequent dissemination of SHIP and monthly status updates.

Subcontractor management is a significant aspect of the WCH mission. With 65 percent of the field work being performed by subcontractors, overall project performance is heavily dependent on ensuring individual subcontractors are aware of, and meet, DOE and WCH expectations. In order to ensure these expectations are understood and met, WCH contractually establishes that subcontractors must use WCH safety and health processes and procedures. This also serves to ensure consistent practices by all subcontractors across the variety of projects. Before work is authorized for the subcontractor, the subcontractor must have met the expectations for Integrated Work Control, including a joint review of the Job Hazard Analysis (JHA) between the subcontractor and WCH.

Each subcontractor also has a WCH Area Project Manager, a Subcontractor Technical Representative, and a Site Safety Representative. These WCH personnel are collocated with the subcontractor at the site and provide day-to-day oversight and direction to the subcontractor. Although there is a contractual separation, the subcontractors are treated functionally on par with any WCH employee and are clearly expected to exhibit the same high standards. Subcontractors participate in LSIT and participate in all WCH safety promotional activities. They have full access to LSIT logs to report safety concerns, as well as the WCH Employee Concerns Program. In addition to the daily oversight and direction, WCH safety staff have frequent interface with

the subcontractors in the field. WCH provides all radiological control support for the subcontractors through ESHI.

WCH has demonstrated its ability to hold subcontractors accountable for performance. On several occasions, WCH has used conditional payment of fees to encourage changes in subcontractor performance. One subcontractor was identified in 2008 as contributing to the majority of recordable injuries. WCH made attempts to change the subcontractor's performance, including withholding of performance award fee. When the subcontractor failed to demonstrate the necessary improvements, WCH did not reinstate the contract.

Another indicator of improvements made by WCH over the past 2 years is that WCH was selected as the Washington Division Nominee for the URS Safe Project/Facility of the Year award. The nomination itself is highly praised by the Washington Division. The Washington Division is the only division of URS to have successfully achieved OSHA VPP Corporate Star status. The Washington Division selected WCH not just for its low TRC and DART case rates, but also for its relentless efforts to continuously improve, and for its mentoring and outreach efforts.

Conclusion

The WCH management team has been exemplary in its demonstration of leadership and commitment to safety. Over the past 2 years, WCH has progressed from an organization that was perceived as valuing production over safety to an organization that values production because of safety. The commitment to provide the necessary resources, the actions that demonstrate the personal leadership and involvement in safety, and the relentless focus on doing the job right are evident and fully demonstrate the Management Leadership tenet of VPP.

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 participation is in addition to the individual right to notify appropriate managers of hazardous conditions and practices.

WCH employees are actively engaged in the safety and health program. A review of program documents and the information collected from interviews with employees indicated that management has fully empowered employees to participate in the safety and health program. Employees were motivated about the company's position on building a safe work environment by keeping them engaged in the company's safety and health processes. Workers are encouraged to participate in safety walkthroughs, attend the annual Hanford Safety Exposition, and serve on a safety and health committee or subcommittee. Employees were familiar with the general principles of DOE-VPP and often indicated their sense of ownership of their safety, as well as their coworkers' safety. Several employees indicated that looking out for their coworkers' safety would be no different than looking out for the safety of a family member. Employees often commented that their respective organizations were like family.

The employees who were interviewed by the Team have worked for WCH for as little as a few weeks up to 4 years. However, the majority of employees interviewed worked for other Hanford Site contractors. Many of these contractors were DOE-VPP Star sites; hence, the VPP culture at WCH only built on what the workforce was already familiar with. Some interviewed workers have been on the Hanford Site for as many as 30 or more years. It was not unusual among those employees to hear stories that indicated that working for WCH provided them even greater opportunities to be more actively involved in the safety and health program even though they had previously worked at a DOE-VPP Star site.

There appeared to have been a general consensus among all interviewed employees that within the past 2 years the safety and health program improved tremendously under the present management team. Several employees commented that first line supervisors were not only now listening to their concerns, but acting on them and providing them with feedback within a reasonably acceptable amount of time.

The Team confirmed employees are involved in a variety of safety-related programs that encourage individual and group participation. Examples include LSIT; Plan of the Day (POD) meetings; Pre-Evolution meetings; JHA development sessions; monthly toolbox meetings; site walkdowns; STS certifications and observations; chairing monthly safety meetings; and the identification and entry of issues and improvements into the Corrective Action Management system, LSIT logbook, Issue Forms, and at regular safety meetings.

Employee expectations go hand in hand with each employee's individual right to notify appropriate managers of hazardous workplace conditions and practices. Both intown and site employees expressed their comfort in raising and elevating safety concerns and often noted how communicating concerns to management has been greatly improved/enhanced under the current WCH management team. Several employees felt that improved communications and managers' open door policy have made positive strides in achieving a fully implemented safety culture.

Employees were generally candid and exhibited a willingness to speak freely with Team members during the interview process. All interviewed employees indicated that they

understood their rights and responsibilities and were very knowledgeable about their safety and health responsibilities. Workers strongly expressed their readiness to pause and/or stop work if they felt conditions were unsafe. They also indicated they would intervene if they observed a potential hazard that would affect their coworkers. During this review, one decontamination and decommissioning (D&D) worker executed a "Safety Pause/Break while he was conducting demolition work on a facility when he smelled "an ammonia-like odor" coming from a pipe. He immediately stopped work and notified the appropriate personnel. Work was restarted after a discussion of the event with the onsite safety representative had taken place and the safety representative cleared the area for the continuation of work. The worker who was interviewed after the incident felt comfortable taking the steps he had taken without fear that there would be any type of negative repercussion.

Employee interviews noted that the handling of employee concerns appeared to be addressed and resolved in a timely manner. Several employees and managers alike attributed this to improved communications throughout the organization and more importantly between first line supervisors and their workers. LSIT logbooks and Issue Forms are available for employees to bring concerns to management and LSIT. Employees are able to submit concerns anonymously, through their supervisors or through other employees. Employees can also bring safety and health concerns and issues to their immediate supervisors' and coworkers' attention during weekly safety meetings and daily POD meetings. Employees were comfortable with the concern resolution and feedback mechanisms available. The Team observed several examples of how employee concerns/issues are brought to their supervisors' attention. In one such case, an employee was concerned about potential contamination of computer equipment he was tasked to work on. The employee notified his supervisor and radiation control manager verbally and through e-mail messages. The radiation control manager contacted the worker via e-mail to assure him the potential for any contamination did not exist because the area of concern was routinely sampled. However, the employee was not initially satisfied and spoke with a VPP Team member. The Team member followed up on the concern with the employee's supervisor and radiation control manager after which the manager offered to personally walk through the area with the employee, as well as to do additional sampling and provide feedback to the worker about the concerned areas to assure him of his safety.

LSIT committees include a chair and co-chair, and at least one craft from each discipline and/or building trade. The LSIT chair meeting is made up of the chairs of all LSIT committees. There are 15 LSIT committees that cover all work organizations within WCH. Members of LSIT committees include the collective bargaining organizations (Hanford Atomic Metal Trades Council (HAMTC) and the building trades) and a senior management advisor and staff personnel. Membership is rotated with personnel from both HAMTC and building trades depending upon location of the LSIT. At the time of this assessment, approximately 30 percent of the workforce belonged to a LSIT. LSIT meetings are held at a minimum monthly and provide workers with an opportunity to review new and ongoing safety ideas, resolve issues, and to recognize safety achievements, safety performance, and safety nominations. Members also discuss lessons learned from close calls or accidents, status reports of subcommittee activities, the promotion of special safety and health campaigns, inspections, and program reviews. The Team observed LSIT meetings that discussed a finger-cut injury that occurred during this assessment. Managers, supervisors, and workers agreed that as a result of a review of the incident, there were areas that needed improvement; primarily, how the injury was handled regarding to the events that occurred immediately following the accident. The lessons were shared throughout the organization, through other LSITs, and news bulletins and updates.

WCH uses Flash Bulletins and Flash Updates to communicate to the workforce that injuries have taken place. Noninjury incidents are communicated to employees via "Dodge the Bullet" or "Do It Right the First Time" publications. These publications describe the incident that occurred and any corrective actions. Lessons learned and other related publications are distributed to all personnel via the Weekly Roundup. Employees are encouraged to read all safety and health publications and discuss them among themselves and at daily meetings.

Employees are also encouraged to participate in special studies that evaluate the safety of equipment and tools. WCH managers formed a multidisciplined cross-project team composed of WCH, the WCH parent company, and subcontractor personnel familiar with shuttle truck equipment and hoisting operations and past events to analyze the risks associated with hook or cable failures (see Worksite Analysis). As a result of employee involvement, employees developed a prototype container hook face modification and a railmounted steel backstop system. At the time of this review, the project team was also working on the development of a prototype for a hoist lever inside the shuttle truck cab that would use levers of different height or knob shapes. By involving workers in the analysis, WCH ensured proposed solutions were practical and effective.

The VPP Passport activity was initiated by a HAMTC employee and is administered by the VPP Steering Committee with assistance from the project or facility LSIT chair and co-chair. The VPP Passport provides WCH and subcontractor employees with safety-related information and how it applies to daily work activities. The Passport challenges all employees', supervisors', and managers' involvement, awareness, and commitment to VPP. The program is divided into two activity sections. Section 1 is for all employees and section 2 for all supervisors and managers. Upon completion of the minimum required activities, the supervisor-approved passport is turned in and the employee receives a recognition award.

Committee meeting minutes are documented and shared with the workforce through the WCH safety Web site, e-mails, and postings on employee information bulletin boards. On a daily basis, workers are involved in their respective POD meetings in which supervisors and workers have the opportunity to discuss any safety and health concerns that affect the immediate work at hand and discuss lessons learned from other organizations throughout the site.

Employees credit the improved employee morale to management's open door policy, which has allowed them to report concerns through informal and formal processes. Improvements in management/worker communication have helped facilitate improved worker/worker communications throughout the project. The Communication Council formed about a year ago was created to improve communications within WCH. The makeup of this council is representative of the total workforce and focuses on how information is received. The Communications division provides employees a variety of communication venues, including news releases, newsletters, displays, posters, fliers, fact sheets, project tours, workshops, and meetings.

The Team confirmed that WCH acknowledges the importance of recognizing employees for participating in company safety awareness activities. WCH recognizes employee contributions and successes that are linked to continuous improvement in safety performance. WCH's recognition program is not limited solely to WCH employees, but also includes all project employees of ESHI, all WCH subcontractors, as well as WCH staff augmentation personnel.

The WCH safety recognition program has seven distinct levels at which an employee can be awarded for safe behavior. They include (1) Spot Safety Award; (2) Individual Weekly Safety Awards; (3) LSIT Monthly Safety Awards; (4) Project Awards; (5) Company Awards; (6) Personal Achievement Awards; and (7) Safety Awareness Campaign Awards. The Spot Safety Award is given to employees for identifying hazards, observing safe behavior, and setting an example by demonstrating safe behavior and proactive contributions to the safety program. An employee may be nominated for an Individual Weekly Safety Award or LSIT Monthly Safety Award by a coworker during the scheduled workweek for also demonstrating safe behavior, identifying hazards, or observing safe behavior. The nomination for the Individual Weekly Safety Award is made through the project safety representative or the local LSIT representative. The Project, Company, and Campaign Awards are all related to achieving company goals. The Personal Achievement Award is awarded to individuals who have completed company-identified training or participated in company-sponsored safety events. The Team interviewed several employees who have been recipients of a number of awards. In general, employees felt that being recognized by the company, as well as their LSIT was "proof" the company "really cares" for its employees. All awards are purchased and logged according to WCH policy.

The WCH employee discipline procedure provides the steps for administering progressive discipline for infractions of the Standards of Conduct. Consistency in the implementation of this procedure is accomplished through Human Resources and Industrial Relations representatives. The progressive discipline process includes three levels of action depending upon the severity of the infraction. This may be a verbal warning, a written warning, or suspension/discharge. An overview of the disciplinary system is discussed in the General Employee Training and reinforced through staff meetings and required reading. Although there were no examples of any employees having been disciplined for unsafe behavior, employees were aware of the procedures and the consequences that may impact them for not obeying company safety rules.

Conclusion

Employee ownership is strongly rooted across the WCH organization. Managers and employees have worked together to develop open lines of communication to identify and promote safety and health responsibilities, goals and expectations, and the identification of potentially hazardous conditions. WCH meets the requirements of the Employee Involvement tenet.

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 mitigative measures during work planning to anticipate and minimize the impact of such hazards.

WCH has developed a process to standardize and apply consistent rigor to the development of work documentation. The Integrated Work Control Process (IWCP) provides a roadmap to the preparer from work scope inception to final approval. A critical step in the IWCP Work Flow Process is to identify and analyze the hazards.

Because of the diverse nature of activities associated with RCCP, the worksite hazard analysis involves thorough evaluations and the implementation of mitigating controls to ensure that work performed does not result in an injury or illness to the workforce or impact to the surrounding environment and public. Establishing baselines for hazards prior to the performance of work is the first step in understanding the challenges the workforce will encounter as they go about their daily work tasks. WCH has documented baselines for its work scope via various means. For field remediation sites, a historical review and evaluation of hazards is conducted and a risk evaluation is documented for the site. For building demolition sites, a history evaluation is conducted and characterization is accomplished prior to disconnecting all external power and services. At ERDF, all waste received is characterized and approved prior to acceptance for disposal.

RCCP routinely performs evaluations of project and nonroutine work activity hazards. As indicated in the preceding paragraph and prior to the start of any work, IWCP requires that tasks are screened for known or potential hazards using the process described in PAS-2-1.1, "Integrated Work Control," and PAS-2-1.2, "Preventive Maintenance." If the screening process reveals a reasonable possibility for exposure to hazardous wastes or substances (including radioactivity), then additional analyses are required as described in SH-1-6.1, "Project/Facility Safety Planning and Documentation," RC-1-10.1, "Planning Radiological Work," and/or ENV-1-1.11, "Chemical Management Program." The screening process includes creation of a Site-Specific Health and Safety Plan (SSHASP), JHA, Radiological Work Permit (RWP), or other supporting documents.

Employees, including safety professionals, engineering staff, craft, and operations personnel are involved in the pre-job planning that includes the assessment of hazards. Pre-job planning is conducted to ensure all hazards are identified, controlled, and include the use of JHA, equipment inspection, procedure validation, walkdowns, and/or safe condition checks, as applicable. These employees use SSHASP, JHA, RWP, and their knowledge and experience to identify hazards and potential environmental impacts within a specific facility or project work activity. Information from the JHA is then incorporated into work packages and procedures, and these may be used as a basis for operator training. Workers perform field walkdowns for validation of technical procedures.

The Team visited, observed work, and reviewed work documentation at field remediation sites (dig sites B/C, D/DR, 300 Area), building demolition sites (100 N and 300 Area), waste disposal (ERDF), and characterization activities in preparation of demolition (100N and 300). At each of the sites, the Team reviewed resources and processes that WCH has institutionalized into its work planning process for self-performed work and flow down of work performed by subcontractors. Documentation reviewed included, but was not limited to, the following: HIM, WCH Field Remediation Health and Safety Plan (HASP), SSHASP, RWP, and JHA.

WCH has developed a site HASP to meet the requirements of title 29, Code of Federal Regulations (C.F.R.), part 1910.120, "Hazardous Waste Operations and Emergency Response." HASP serves as a resource to identify, evaluate, and mitigate expected hazards during development of JHAs and work plans. HASP contains descriptions of generic hazards as guided by the requirements of OSHA for Hazardous Waste Operations.

In addition to the sitewide HASP, each worksite may develop an SSHASP when a unique variety of hazardous constituents exists that is not adequately covered in the sitewide HASP. For example, excavation at some of the remediation sites may uncover a variety of hazardous materials that is unique to the DOE complex. SSHASP also includes an emergency action plan and detailed actions in the event of incidental releases of hazardous material.

In its 2009 SHIP, WCH identified a desire to develop a sitewide HIM to identify the hazards that are found throughout all the project locations. This document was written to supplement the project health and safety plans and provide an easy way to update project hazards in one document and assist with configuration control of the documents. HIM consists of the identified generic hazards and links them directly to the standard controls to mitigate or eliminate those hazards. As described in WCH-289 (HIM document), "It is the intent of this document that if a hazard is of a general nature and is identified here, it does not need to be duplicated as part of the Project's task specific work control documentation (e.g., JHA, work package, or task instruction)."

For work in radiological areas, WCH uses RWPs to document the expected radiological conditions, monitoring requirements, required radiological personal protective equipment (PPE), and limits for the proposed activity. Typically, RWP includes previous survey information, expected contamination and dose conditions, any special conditions, and entry requirements.

For specific tasks performed within the project, IWCP requires the work planning team to develop a JHA as the final step in work planning. This team is led by the work planner, and consists of craft and professionals (engineers, industrial hygienists (IH), industrial safety specialists, radiological control, or subject matter experts). The team reviews the work scope step by step, reviews characterization and historical data, reviews previous evaluations (HIM, HASP, SSHASP, RWP) identifies hazards, and documents controls. Within the JHA process are tools employed to further refine the extent of hazard and risk associated with that hazard. The JHA process is also used to identify and/or develop specific training needs for a task. Training can range from simple pre-job discussions to full mockups for practicing necessary job tasks. All employees who participate in JHA sign the cover sheet for concurrence and can be contacted as necessary.

For field work, WCH provides a risk evaluation tool that provided a subjective numerical system based on the experience and knowledge of the team to screen proposed work as high, medium, and low risk and complexity based upon standard questions. WCH is reevaluating this screening

method based on comments received from the Defense Nuclear Facilities Safety Board. WCH also employs a process for evaluating expected chemical hazards that documents and evaluates the rationale for sampling and monitoring at field remediation sites. The information derived from HIM, HASP, SSHASP, RWP, and JHA are collectively incorporated into the work plan or procedure for use by the workforce in the performance of work evolutions. The work package, JHA, RWP, and other supporting documents are then reviewed during the pre-evolution briefing.

WCH tracks and trends a variety of information beyond lost workdays and injury/illness rates. Air sample data is tracked, evaluated, and retained for worksites where airborne contaminants are the major exposure path. The Team reviewed the compilation of sample data at field remediation sites and at ERDF. Sampling data reviewed includes date, time, analyses, action level, and result. Other performance indicators that are tracked by area include, but are not limited to: (1) radiological controls (RWP violations per 1000 entries, contaminations, training deficiencies, training no shows); (2) environmental (environmental spills, sample records, packaging and transportation issues); (3) safety (LSIT logbook, vehicle safety, electrical safety); (4) engineering (conduct of operations occurrences, IWCP issues, human error issues); (5) quality assurance/corrective action management (assessments completed, overdue corrective actions, days to issue analysis); and (6) project-wide (technical safety requirement violations, employee concerns, management walkthroughs).

The Team identified several strengths in the WCH worksite analysis processes. For example, WCH safety representatives were observed to be actively engaged with subcontractors during the performance of their work. They were in constant communication with the subcontractors relating to safety issues, work performance, and ensuring WCH flow down was effective. Employee involvement in the process and the free flow of information was also a positive sign that the VPP culture was, indeed, very strong at WCH. The extensive use of dust controls across all worksites, coupled with the engineered controls discussed in the Hazard Prevention and Control section, reflects effective hazard analysis and control methods.

The development of a process to identify, quantify, and evaluate potential chemicals that may be encountered during field remediation activities provided a basis for an effective sampling strategy while excavating old burial sites and was identified as a strength at WCH. The compilation of air sample data was readily available for review. ERDF posted the air sample data for all of 2008 on a bulletin board in a common area for review by all employee and visitors. The data included date, time, analysis, action level, and results.

WCH has also undertaken special analyses when warranted. Most recently, in response to an event at another Hanford contractor site, WCH performed an analysis of the risks associated with metal cable and hooks used to load and unload waste containers to and from the shuttle trucks. In that analysis, WCH used engineers, craft, and supervisors to identify and mitigate the risks of the stored energy in the cable and hook assembly. A number of process improvements were identified, including equipment modifications and operating instructions. Although WCH has not had any accidents or incidents associated with this risk, the analysis represents a thorough and effective effort to go beyond requirements and ensure a safe workplace. An opportunity exists to perform similar analyses on other stored energy sources, such as compressed breathing air, hydraulics, or electrical sources associated with equipment operation.

Opportunity for Improvement: WCH should consider additional engineering studies of stored energy systems to ensure equipment design, operation, and maintenance support continued safe operation in RCCP.

The Team reviewed WCH procedures for conduct of accident or incident investigations and reviewed reports from past investigations. WCH procedures ensure accident/incident investigations are conducted using a graded approach depending on the severity of the accident or incident. Accident investigations are performed in accordance with SEM-3-2.1, "Accident/Incident Investigating and Reporting Requirements." All OSHA recordables, first-aid cases, property/vehicle damage, and near-misses are investigated. Root cause determination is a part of the investigation. Accident/incident investigations include appropriately trained line managers and facility personnel that respond to ensure the scene is preserved and witnesses are interviewed. Line managers are responsible for notifying the appropriate organizations and determining the extent and type of investigation to be conducted. Teams coordinate with and use safety and health professionals and appropriate employees. For minor accidents, injuries and illnesses, the immediate manager and/or supervisor perform the investigation. As the accidents, injuries, or illnesses become more severe, higher levels of managers are involved. All incidents from first aids to recordables, including vehicle incidents, are reviewed with the Site Representative, Safety, Health and Quality director, and Safety and Health manager. WCH Lessons Learned Coordinator issues formal lessons learned if appropriate. Lessons learned are shared via e-mail at staff and safety meetings, and are included in formal training as appropriate. Lessons learned from throughout the DOE complex are reviewed for applicability at both the site and project levels.

The Team reviewed WCH instructions for development of JHAs and discussed the expectations for JHAs with workers, supervisors, and safety professionals. Instructions provided for preparation of JHAs in the IWCP included no details regarding hazard analysis. The JHA instructions jumped directly from identification of the hazard to identification of the control. The forms used for JHA reinforce this limited process without providing a section to document any comprehensive analysis of the hazard. Further, the only individuals trained on the JHA process are the work planners who lead the team meeting to develop the JHA. Based on interviews conducted by the Team, training of other JHA team members, including craft participants, no longer occurs.

The Team identified some opportunities for improvement with the documented hazards analysis that drive appropriate controls for the identified hazards. An essential purpose of hazard analyses is to help employees identify and eliminate assumptions and blindspots related to hazards and risks. Analysis of the hazard needs to foster a questioning attitude with the team performing the analysis and should result in the correct selection of controls based on that thorough analysis. In several analyses reviewed by the Team, the analysis of the hazard was either missing or incomplete. For example, references to chemical hazards often referred the worker to "read the Material Safety Data Sheet (MSDS)," leaving the worker to evaluate the appropriate controls based on the MSDS. Another example was in a JHA for loading and unloading waste containers from the shuttle trucks. In that case, the hazard identified was a crushing hazard if the container fell off the shuttle truck. The identified control required that workers should not stand within one container width of the side of the truck, or two container lengths in front of or behind the truck. No discussion was included of the analysis that determined why one container width was sufficient to prevent worker injury or exposure in the event of a container fall or spill or if changes from the original analysis parameters and assumptions would result in these controls being ineffective.

In some cases, workers have identified potential exposures or hazards that have not been included in JHAs or other hazard analyses. For example, during a POD meeting, workers were

discussing a situation where the smell of ammonia was detected during demolition of N Reactor buildings by a subcontractor several days earlier. Personnel involved complied with instructions to stop work and notify supervision at the time the potential hazardous exposure was detected per the JHA and work plan. Upon review of the JHA (ISS-08-12-10-001, Building 109-N Demolition and Ion Exchange Removal), the only indicator relating to potentials for chemical exposure of this type was the section on anomalies. The Team could find no evidence of chemical characterization information included in the JHA anomaly section or discussion about hazardous chemicals that may be encountered during demolition other than asbestos and lead, which was covered in a separate work package and JHA. It was pointed out by a WCH safety representative that during the operation of the reactor, ammonia and hydrazine were used for corrosion prevention. Since the systems had been rinsed three times, the ammonia smell was not anticipated. Only a generic description on anomalies is presented without specific mention of either chemical in the JHA. A systematic review of the potential hazardous chemicals utilized during reactor operation should have been included or referenced in the JHA. In addition, the process employed by field remediation sites for encountering chemicals applied to provide controls and contingencies should workers encounter unknown chemicals should have also been reviewed. A review was still in progress at the time of the Team's departure.

The Team observed one particular situation where failure to perform a systematic hazard analysis could have resulted in significantly increased radiation exposure to workers. During a pre-evolution brief to draw water samples from a watershielding door in the 100N Area, one of the Team members asked for additional information regarding the radiological effects of removal of the water from the shielding tanks. The team preparing to perform the sampling soon recognized that the shielding tanks were protecting workers from a high radiation area and that removing some of the water could result in increased radiation rates and potential streaming in the work area. As the work team continued to review the task, they recognized that the work scope had significantly changed. The original work plan was to remove a total of 200 ml of water from 3 separate tanks. At the briefing, the plan had changed to removing 3 samples of 500 ml each from the 3 tanks. A JHA had been prepared for final removal of the shield door, which properly addressed the radiological effects of the shield door removal. However, the JHA was not used or referenced for the sampling evolution. As a result, the consequences of drawing too much water from the tank were not properly evaluated or understood by the workers drawing the sample. The work team demonstrated an effective technical questioning attitude during the pre-evolution brief and did not start work until the additional hazards could be addressed. However, the work planning system did not function effectively in this case to ensure all the hazards were correctly addressed before the work was released. Had the questioning attitude not been employed, there may have been a potential to expose employees to higher than anticipated radiological dose conditions.

WCH has high expectations for quality and safety that has been supported by management and the workforce, but those high expectations have not been effectively implemented for JHAs. WCH should revise the JHA procedure to include clearer expectations for hazard analysis. Analysis questions should be integrated into the process. Some analytical questions to consider include:

- Are there applicable regulations, codes, or standards that apply to this hazard?
- What are the potential pathways for the worker to be exposed to this hazard?
- How much of the hazard is present (e.g., quantity of chemical, weight of container, height of hazard, voltage, depth of excavation)?

- Is there an exposure limit associated with the hazard?
- Is a new hazard being introduced during the work (removal of shielding, removal of interlocks, removal of facility safety systems, introduction of inert gases)?
- Are there lessons learned associated with the work or the hazard that should be captured?
- Are the controls selected justified by the analysis?
- Are the generic controls identified in HIM or HASP applicable for this specific work?

Opportunity for Improvement: WCH should revise instructions for preparation of JHAs to clearly define and document the analysis that links the hazard identification to the selected set of controls. After revision of the procedure, WCH should conduct training for all work planning team members on the process.

Conclusion

WCH has effective methods and processes in place to identify hazards associated with RCCP. In all cases, employees demonstrated the ability to recognize new or unexpected hazards and to pause or stop work when those conditions were encountered. WCH should be able to gain significant improvement in its work planning process by modifying the planning process to perform and document more detailed analysis of those identified hazards. The ability to perform and document detailed hazard analysis has been demonstrated through special studies and lessons learned and should be incorporated into the work planning process.

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, and/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. Those rules/procedures must also be followed by everyone in the workplace to prevent mishaps or control their frequency/severity.

Substitution and engineered controls are the preferred method used by WCH, followed by work practice controls. When those controls are not sufficient, PPE may be used. PPE is only used as the final protection level that engineered controls, substitution, and administrative controls could not mitigate or when otherwise required by regulations.

WCH has demonstrated a healthy interest in developing and improving its current processes to reduce and/or eliminate hazards to the workforce, the environment, and the public by acquiring new engineered controls through commercial resources or developing them internally.

Numerous examples of engineered controls were observed by the Team during the review. Examples ranged from the daily application of soil fixatives to reduce potential spread of contamination of workers at ERDF, the acquisition of a remote controlled concrete scabbler device to remotely scabble highly contaminated concrete from D&D facilities cell walls, and the use of remotely controlled water cannons to reduce dust and spread of contamination during D&D activities.

The most innovative example of WCH's engineered controls was the development of the Compton Ratio Analysis for Testing Environmental Radioactivity (CRATER) device. Prior to CRATER, field remediation employees would excavate suspect spent nuclear fuel (SSNF) from burial sites into "survey mounds." The spoils would be transported to an evaluation area where the Radiological Control Technicians (RCT) would don PPE and manually survey the mounds for SSNF. WCH recognized this process was time-consuming, required multiple stages of handling the same material, and unnecessarily placed workers in contact with potential dose and other physical hazards. Through the use of professional expertise and workforce involvement, WCH worked, in conjunction with Chesapeake Nuclear Services, to develop a radiation detection device that could be directly attached to the excavator bucket and within 15 seconds determine if any SSNF materials were present and remotely transmit that information to the RCT monitoring the readouts. The development of CRATER involved analyzing the specific range of expected dose from the fuel, selecting the appropriate monitoring sensors to detect those dose ranges, and the development of software meeting DOE quality assurance requirements that could identify those ranges while compensating for the potential shielding provided by the soil in the bucket. CRATER began its field operation in January 2009 and except for some transmission strength issues with the remote sending unit, the device has been quite successful. In addition to eliminating the need for RCT surveys in the excavated materials, CRATER has accelerated the excavation and analysis process by eliminating several of the previous steps required for the manual surveys. At the time of the Team's review, WCH had already initiated steps to continue to improve the integrity of CRATER and refine the software to provide greater accuracy and reliability.

When engineered and administrative controls are not enough, use of PPE is required and is specified in work documents, such as operating and maintenance procedures, technical procedures, work packages, and RWPs. PPE, including footwear, eye, hand, hearing, and head/face protection, and high visibility vests, is controlled and distributed by facility operations organizations as required for completion of work activities. During Team work observations, all WCH and subcontractor employees were observed utilizing appropriate PPE and honoring all postings as prescribed by the work controls requirements. When required, respiratory protection equipment is selected and approved for use by qualified IH or RCT professionals. In addition, WCH workers were given the opportunity to request specific PPE based on personal comfort or needs. Several workers explained they preferred tight-fitting respirators, fullface, or silicone only due to skin allergies.

During the review, the Team observed or was informed of three instances where workers stopped work and evacuated from the work area due to unplanned conditions. Two of the instances involved unanalyzed smells, and the third was the result of a faulty air supply regulator momentarily interrupting the bottled air supply to four workers. In all cases, the workers recognized the conditions were not properly characterized in their work scope and retreated from the area to reevaluate. The workers' actions effectively demonstrated their ability to recognize unanalyzed hazards and initiate stop work as required by the WCH work control process. Because of the workers' quick response, no injuries or ill effects were observed with the workers involved in any of these situations.

The WCH Maintenance Implementation Plan describes a graded approach for conducting ongoing maintenance activities for associated support facilities and systems, structures, and components (SSC) necessary to accomplish WCH project goals. During the course of WCH D&D activities project, the scope of work and the hazards encountered are expected to continually evolve. As project work continues, additional portions of these facilities and SSCs will be shut down, isolated, and removed from service. Consequently, surveillance and maintenance requirements and activities must also evolve to address changing facility and site conditions.

A computerized Preventive Maintenance (PM) recall program was established to lengthen equipment run time and to avoid equipment failure. PM activities are scheduled by due dates, typically determined by adding the frequency to the last completed date. Frequencies are established based on manufacturers' recommendations, plant operating experience, engineering requirements, and in some cases, equipment history.

PM/calibration activities are tracked electronically to ensure timely completion. The WCH PM program does utilize a grace period process, which allows performance of PM beyond the established frequency while staying within the assigned interval.

Team observations and interviews verified the effectiveness of the PM process, and PMs were being performed within the established frequencies. PMs and corrective maintenance on heavy equipment were performed on two shifts, both in the shop and in the field when necessary. Work performed was routine for skilled mechanics with proper PPE utilized. For significant work, equipment was sent to the manufacturer dealership for repair (transmission or significant engine repair).

WCH facilities/project areas are responsible for developing and maintaining Emergency Preparedness (EP) Hazard Assessments and Emergency Response Procedures. Drills are an

integral part of the EP program. Drills are used to train employees and test the effectiveness of their emergency response capabilities.

Each facility/project employs an EP Field Emergency Response Organization team involving employees from various functional areas, both within the facility and from other WCH facilities/projects. This ensures a broader perspective in the evaluation of drill performance and aids in the sharing of lessons learned. The team meets prior to the drill to receive instruction from the drill coordinator and familiarize themselves with the expected actions to take place. Following the drill, a post-drill evaluation "hot wash" is held to receive participant and evaluator input, and a summary drill report is issued. Lessons learned are included in the post-drill report and incorporated into other facility drills as appropriate.

Two drills were observed by the Team during the review, one at the ERDF facility and another at D Area. Both reviews were well prepared and executed with lessons learned discussed in the "hot wash" session. Participants' responses were evaluated, and opportunities for improvement were identified.

The requirements in the Radiological Control Manual comprise a plan for controlling and monitoring workers' exposure to radiological hazards during the conduct of radiological work per the requirements of 10 C.F.R. 835. WCH utilizes thermal luminescent dosimeters to measure individual workers' exposures during work activities to ensure compliance with administrative exposure limits and quantify worker dose. WCH monitors airborne radioactive contaminants via continuous air-monitoring systems at each worksite. The results are utilized to determine the need for respiratory protection or to validate that respiratory protection is not required. RCTs perform periodic routine and job-specific surveys to monitor for changes in conditions or to establish radiological requirement for a specific job evolution. WCH tracks and trends skin contamination events on a rolling 12-month average. Additionally, embedded in the Radiological Control program, as low as reasonably achievable (ALARA) reviews and evaluations have contributed to a reduction in overall dose committed to the workforce by utilizing remote-sensing equipment and managing exposures. When jobs exceed certain thresholds for worker exposure, ALARA reviews are performed to identify means to reduce those exposures. WCH also makes use of mockups to train workers on specific situations and further reduce exposures. As a result of these efforts, WCH has significantly reduced worker radiation exposures.

WCH utilizes the RWP process to define specific controls for work in radiological areas. In RWP, radiological workers and RCTs performing work are given information about area/ job-specific radiological hazards, the degree of coverage necessary from RCT personnel, requirements for PPE as necessary, and limits at which work activities must be suspended. Each worker is responsible to read, understand, and comply with RWP requirements. Additionally, each individual performing work under an RWP is responsible to know the controls and limits set forth in RWP and to work within them.

The primary objectives of the WCH occupational health program are to maintain a healthy workforce, promote a healthful work environment, and establish worker protection requirements that protect the health of employees whose job assignments place them in potentially hazardous working environments. The WCH medical program is supported by AdvancedMed Hanford (AMH) and is administered by the safety and health organization. This program is primarily responsible for performing occupational medical exams, a first-aid program, and the Employee Job Task Analysis (EJTA) process.

The Site Occupational Medical Provider has a staff of physicians, physician assistants, nurses, and other medical specialists trained in Occupational Medicine. Occupational Medicine staff and project IH meet regularly to discuss the results of studies and trends related to physical results and exposures. This information is used to help define the need for additional workplace monitoring or emphasis during periodic reviews of comprehensive baseline surveys.

WCH uses the EJTA process to identify employees with potential for exposures requiring enrollment in specific medical-monitoring programs (e.g. lead, asbestos, or beryllium). The employee's manager, with input from the employee, the facility/project IH, and the safety representative, completes the EJTA. EJTA identifies the physical requirements of the employee's job and potential exposures to hazardous chemicals/materials. Once established, the immediate supervisor reviews the EJTA with each employee. The Site Occupational Medical Provider develops and performs any required physical evaluations identified by the EJTA process. One concern identified during interviews revealed that the individual EJTAs may not be updated in a timely manner when employees change work assignments. Employees typically review the EJTA with the medical provider during annual physicals, but they normally focus on their current job assignments. AMH intends that the EJTA should cover all jobs the employee may perform in the coming year. Consequently, when employees are assigned to new job assignments or new areas during the year, the EJTA may not accurately reflect those new assignments.

Opportunity for Improvement: WCH should ensure that EJTAs are reviewed and updated when workers change work assignments.

WCH also assisted injured and/or ill employees in providing options to obtain care from additional health care providers in addition to their personal medical provider for work-related injuries.

WCH has a qualified, competent staff of safety professionals. The expertise consists of IHs, health physicists, engineers, electrical inspectors, asbestos work supervisors, and analytical personnel. These personnel have the expertise to accomplish a variety of activities, including safety and health program planning, policy and standards development, radiological controls coordination, and injury/illness recordkeeping within the various organizations, as well as in the facilities. All work observed by the Team and interviews conducted with WCH employees reinforced the availability of professional expertise to the workforce.

These standards of conduct apply to all WCH employees with the exception of disciplinary action involving bargaining unit and subcontractor employees, which will be in accordance with the labor agreement or subcontractor's contract, respectively.

Conclusion

WCH has appropriate controls established, and with the exception of one instance, those controls are well implemented and practiced to ensure a safe workplace. Hazards are well communicated and understood by the workers interviewed and observed. WCH has met the expectations for the Hazard Prevention and Control tenet.

VII. SAFETY AND HEALTH TRAINING

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

The Safety and Health Training Program was evaluated by reviewing training material, attending selected training classes, and interviewing bargaining unit and exempt employees, supervisors, and managers. WCH provides training to all its employees either internally or by using contractors, such as the American Red Cross, HAMMER, EnergX, or other training vendors. The subcontractors are responsible for providing training to their employees. All WCH and subcontractor employees receive appropriate safety and health training and refresher training.

The new employees take a 4-hour, computer-based Hanford General Employees Training (HGET). HGET is a combination of training developed by many sources, including WCH. Additional training needs are identified by the new employee's supervisor, the department safety representative, and the department training representative using the Training Assignment Tool (TAT). TAT provides a stringent set of position activities and position designators for analyzing the job position/tasks and develops course work and infield training materials to teach the employee job-related tasks. One of the components of TAT is the ability to link the job assignment to a number of training position descriptions (TPD) where each TPD consists of the training/course requirements for the identified position (e.g., supervisor, radiological worker, resident engineer, beryllium worker). By linking TAT to TPD, the manager has an effective tool for the development of training and courses that the employee must perform to be competent in his/her duties. Examples of training needs identified by TAT are First Aid, Cardiopulmonary Resuscitation (CPR), Automated External Defibrillator (AED), asbestos awareness, bloodborne pathogens, confined space, ladder, hoisting and rigging, and excavations. RCCP employees whose job assignments require work with hazardous materials, including radioactive material, must complete 40-hour Hazardous Waste Operations/Emergency Response (HAZWOPER) Training required under 29 C.F.R. 1910.120: 8-hour HAZWOPER refresher annually, and Radiological Worker training and refreshers biannually. Completion of training is recorded and tracked in the Training Records Information System (TRIS).

CPR, First Aid, and AED training provided by the American Red Cross are mandatory for first line supervisors, RCTs and IHs, and optional for other employees. Most of the classroom training is provided at the HAMMER facility located in the tri-city area. Some classroom training is also provided by WCH subject matter experts. Additionally, WCH uses outside training providers as needed.

While most new hires and reassigned employees are experienced crafts people proficient in their respective crafts, D&D work is somewhat unique and requires on-the-job training (OJT) for certain equipment. OJT is provided by experienced workers who mentor the new workers. After completion of OJT, the new workers must demonstrate their proficiency on the equipment to their supervisors. Even though this training is not formal, it is documented and included in the employee training record.

WCH has used performance indicators at the senior management level to identify and revise training needs. For example, based on historical problems at RCCP, WCH is focusing on

conduct of operations (ConOps). WCH developed a ConOps training module for employees and supervisors to address those issues. The number of ConOps related events and occurrences has been tracked by the senior management team. The efficacy of that training is being monitored, and the number of ConOps issues has been trending downward.

WCH has broadly encouraged supervisors and managers to pursue certification as STS. This certification is 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 STS certification must renew it annually and meet recertification requirements every 5 years. WCH provides courses to assist supervisors and managers in achieving and maintaining this certification. The training consists of five modules: Module One--Introduction to OSHA; Module Two--Accident Investigation; Module Three--Respirators, Confined Spaces, and Personal Protective Equipment; Module Four--Cranes, Derricks, and Hoists; and Module Five--Fall Protection, Hand Tools, and Hazard Communication. The ERDF Safety Representative is certified to teach the 10-hour OSHA class and teaches the five modules at various sites. Approximately 205 WCH and subcontractor employees (supervisors included) have been certified as STS.

Training sessions observed by the Team included HGET (review of course content), ConOps training at the 100D Area, and an STS training module. In all cases, the presentation material was informative. The concepts were presented in a way that could be understood by the students. The instructors were knowledgeable of the content and were able to answer questions posed by the students. The settings were informal and the instructors encouraged student participation.

TRIS generates monthly reports of training schedules of the employees. The training coordinators at each site receive the monthly training schedule and forward this information to the supervisors. The supervisors inform the employees of upcoming or delinquent training in the POD meetings. If the employee fails to take the required training, the supervisor is notified by the training coordinators to remind the employees again to take the training before the certification lapses. According to WCH policy, failure to take the required training after the supervisor's reminder may lead to disciplinary action up to and including termination.

Training delinquencies are tracked and monitored by the senior management team. Delinquencies are classified as Class I, Class II, or Class III. Class I means that the employee cannot perform his primary function without the specified training. Class II means that the employee can perform some, but not all, of his primary function in which case a letter is written to the employee and his/her supervisor and placed in the employee's training record stating the limitation of his work scope with a firm date for completion of the training. Class III means that the employee is delinquent in training, but such training typically supports ancillary duties or TPD needs revision. Class I delinquencies dropped from 22 in October 2008 to 10 in February 2009, Class II delinquencies from 240 in October 2008 to 25 in February 2009, and Class III from 293 in October 2008 to 270 in February 2009. The total delinquencies dropped from 555 in October 2008 to 305 in February 2009. In summary, the delinquencies dropped significantly since October 2008, but Class III delinquencies are still high. With a workforce of approximately 1,400 people, the number of Class III delinquencies indicates that approximately 20 percent of the workforce has some training delinquency or needs TPD revision. There is a

risk that some workers may be performing tasks that are not reflected in their TPD and for which they may not have completed appropriate training.

Opportunity for Improvement: WCH should ensure that all TPDs are up to date and that all workers have completed required training.

Conclusion

Safety and health training continues to be a top priority at WCH. Part of each supervisor's performance evaluation is achievement of ontime training for each employee under his/her supervision. The identification of various required training courses is rigorous and on target to meet legal and performance standards. The courses are effective in building safety performance and implementing a culture of safety.

VIII. CONCLUSIONS

When WCH took over RCCP in 2005, the partner companies and their subcontractors faced significant challenges, and their understanding and assumptions about how the work was to be performed did not live up to expectations of DOE, the Washington State Department of Environment, or the Environmental Protection Agency. Over the following 2 years, WCH was plagued by errors, and in one significant case by a falsification of records by a subcontractor employee. Following those problems, the parent companies recognized significant change was needed and took action. A new management team was put in place at WCH with extensive experience in managing DOE construction and environmental remediation projects. Their experience from Savannah River, Rocky Flats, and the Idaho Cleanup project was instrumental in bringing about a rapid change in the corporate culture at WCH. As a result of changes in management style, clear expectations for excellence in both safety and production and a focus on performing work safely and compliantly the first time, WCH is not only meeting production goals, but is doing so without endangering workers, the environment, or the public. By fostering and valuing employee involvement, WCH is identifying new methods to perform its mission at reduced costs and may be able to achieve its mission ahead of schedule. Extensive efforts to correctly identify potential hazards and implement effective controls are evident. WCH has demonstrated the ability to perform effective hazard analysis, but has opportunities to improve that analysis in the work planning process. As a result, additional dividends will probably be recognized as they make those improvements. Employees at RCCP are trained, qualified, and experienced and continue to make valuable contributions to the safe accomplishment of the WCH mission. In conclusion, the Team is recommending that WCH be admitted to DOE-VPP at the Star level.

APPENDIX A

Onsite VPP Audit Team Roster

Management

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