Washington River Protection Solutions, LLC
Tank Farm Operations Contract

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
November 1-11, 2010

U.S. Department of Energy
Office of Health, Safety and Security
Office of Health and Safety
Office of Worker Safety and Health Assistance
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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 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 designed to apply 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 Washington River Protection Solution, LLC (WRPS), the Hanford Tank Farm Operations Contractor, during the period of November 1-11, 2010, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding WRPS participation in DOE-VPP.

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ABBREVIATIONS AND ACRONYMS

ALARA	As Low As Reasonably Achievable
AMH	Advanced Med Hanford
BLS	Bureau of Labor Statistics
BTR	Buyer's Technical Representative
CBT	Computer-Based Training
CFR	Code of Federal Regulations
CHAT	Chemical Hazard Awareness Training
CVST	Chemical Vapor Solutions Team
DART	Days Away, Restricted, or Transferred
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DSA	Documented Safety Analysis
EAPC	Employee Accident Prevention Council
EJTA	Employee Job Task Analysis
ESH&Q	Environment, Safety, Health and Quality
FEHIC	Facility Emergency Hazard Information Checklist
FY	Fiscal Year
GHA	General Hazard Analysis
HAMTC	Hanford Atomic Metal Trades Council
HGET	Hanford General Employee Training
HPI	Human Performance Improvement
HSS	Office of Health, Safety and Security
IH	Industrial Hygiene
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
ITEM	Integrated Training Electronic Matrix
JHA	Job Hazard Analysis
MARS	Mobile Arm Retrieval System
MSDS	Material Safety Data Sheet
NAICS	North American Industry Classification System
OJT	On-the-Job-Training
ORP	Office of River Protection
OSHA	Occupational Safety and Health Administration
PER	Problem Evaluation Report
PM	Preventive Maintenance
POMC	Performance Objectives, Measures, and Commitments
PPE	Personal Protective Equipment
SWE	Safe Work Environment
Team	HSS DOE-VPP Team
TOC	Tank Operation Contract
TRC	Total Recordable Cases
VPP	Voluntary Protection Program
WRPS	Washington River Protection Solutions, LLC
WTP	Waste Treatment Plant

EXECUTIVE SUMMARY

In July 2008, the Department of Energy (DOE) Office of River Protection awarded the Tank Operation Contract to Washington River Protection Solutions, LLC (WRPS), replacing the former tank operations contractor. The operational phase of the WRPS contract went into effect on October 1, 2008. Two organizations under the former contractor were DOE Voluntary Protection Program (VPP) Star participants. Under the contract transition process, WRPS committed to maintaining that Star status, and believed that changes to the program would not be so extensive as to require withdrawal from the program. As such, WRPS was placed in a transitional status until such time as an onsite evaluation by the Office of Health, Safety and Security (HSS) could be performed. This report documents the result of that evaluation.

Throughout the transition process, WRPS has maintained very low accident and injury rates that are 80 percent better than its comparison industry. The HSS DOE-VPP Team's (Team) review of accident and injury logs, as well as interviews with workers, did not reveal any concerns with underreporting or improper classification of worker injuries. Further, most accidents and injuries are occurring from low hazard activities as a result of slips, trips, and hand/finger injuries, not as a result of the higher hazard work associated with management and cleanup of the tank farms.

There is no doubt that WRPS managers are firmly committed to establishing a safe and healthy work environment. WRPS has not yet effectively translated that commitment into a mature, effective working partnership with the workforce. Many changes made in the previous 2 years have been made without ensuring worker input and concerns are adequately addressed, and the workforce has not effectively committed to those changes. WRPS managers are struggling in some cases to overcome many years of workers' previous history at the tank farms. Efforts to achieve more efficient performance and increase accountability have, in some cases, been stymied by workers who feel disenfranchised and mistreated over the years. Some project areas are functioning much better and should be considered as a model for other areas that are struggling to implement an excellence model in safety and health. Recognizing the need for change, WRPS managers have increased their field presence, but they must be much more proactive in reaching out to the workforce to gain its trust and acceptance in order to achieve DOE-VPP Star status.

WRPS has retained the primary means of encouraging employee involvement through the transition process. Most Employee Accident Prevention Councils (EAPC) are functioning very effectively to encourage worker ideas and resolve worker issues. EAPCs, representing the bulk of the bargaining unit workers, have seen a reduction in employee participation. In those cases, managers and workers have not yet consistently worked together to share positive lessons learned and experiences between EAPCs. Bargaining unit employees' attendance at EAPC meetings has dropped, and some workers and managers have not developed sufficient mutual trust and respect to form teaming relationships. Overall, direction and guidance to EAPCs has not been effective in developing a consistent teaming approach. Additional recognition and encouragement of workers to raise concerns and proactively assist managers in developing campaigns and initiatives will help raise safety awareness and reverse negative trends. Both managers and workers must develop a path forward to communicate and implement a proactive teaming approach to safety that allows and encourages employees to take ownership of the safety program to move to the Star level.

WRPS and the previous tank farm operating contractor established an effective technical basis that captures the analysis of the tank farm vapors, one of the primary safety concerns at the tank farms. The Chemical Vapor Solutions Team and industrial hygienists continue to work together to analyze the hazards and risks. WRPS is also working closely with the Waste Treatment Plant (WTP) construction project to ensure actions taken in the tank farms will not adversely affect eventual operation of WTP. Throughout the transition process, WRPS has had multiple assessments of Integrated Safety Management (ISM) that verified the essential elements of ISM are in place, but identified that there are some continuing issues in work planning and control and hazard analysis. WRPS needs to continue working to improve those issues and allow improvements to mature and stabilize before they are evaluated for effectiveness. The worksite analysis tenet of VPP cannot be considered met until those changes have had sufficient time to mature.

Overall, WRPS has an effective hazard prevention and control program. WRPS has proactively pursued new technologies and methods that reduce potential worker exposures to hazardous tank vapors. WRPS has identified some weaknesses in work planning, scheduling, and preventive maintenance and is in the process of addressing these weaknesses. WRPS managers should further engage the workers in a collaborative process that will effectively address these weaknesses.

WRPS safety and health training and the associated training and qualification programs are well established and ensure that employees are appropriately trained to recognize the hazards to protect themselves and their coworkers. WRPS training programs equip managers, supervisors, and employees with the knowledge to understand the established health policies, rules, and procedures in order to promote safe work practices and minimize exposure to hazards.

Throughout this report, the Team has identified opportunities for improvement. These opportunities indicate areas the Team believes are critical for WRPS to achieve DOE-VPP Star status. The Team recognizes that WRPS has made significant progress toward achieving 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. As such, the Team recommends that WRPS be moved from the transitional status and be admitted to DOE-VPP as a new applicant at the Merit level. As a Merit participant, WRPS will address the identified opportunities for improvement with the committed assistance from HSS. In addition, HSS will perform annual progress assessments until WRPS achieves Star status.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
WRPS should revise the performance incentives program to clearly identify to workers the actions they should perform in order to earn periodic performance incentives.	**4**
WRPS needs to resolve issues identified in the past external and internal reviews of its ISMS, stabilize the work planning and control processes and procedures, and ensure workers fully understand, agree with, and implement those processes and procedures.	**7**
WRPS managers, supervisors, and workers all need to commit to eliminating any appearance of a hostile work environment, and ensure those that will not make such a commitment are held accountable.	**7**
WRPS should work toward fully integrating goals between the POMC and the EAPCs and find ways to link employee awards and incentives to actions that help meet those goals.	**8**
WRPS should identify and implement specific team building activities and training for the Area Teams in Base Operations.	**8**
WRPS managers should significantly increase their presence in the workspaces beyond the one observation per month in order to establish effective working relationships with the workers.	**8**
WRPS should indentify and implement training for managers on effective change management strategies and ensure worker input for future changes is actively sought and used.	**8**
WRPS should consider reinstituting Employee Response Teams to help identify, communicate, and resolve workers' concerns related to the changes being made.	**9**
WRPS needs to implement an effective, performance-based element to its annual VPP self-assessment and ensure the assessment is sufficiently self-critical and performance-based to identify improvement opportunities and establish specific safety improvement goals.	**9**
WRPS should implement a process to provide for cross-organizational observation and mentoring for workers, supervisors, and managers as a means of breaking down organizational barriers, sharing lessons learned and experiences, and encouraging more consistent implementation of safety processes and procedures.	**9**
WRPS should work with HAMTC, ORP, DOE-Richland, and other site contractors to ensure that workers not only have the right and ability to stop work, but also a means to pursue a less restrictive process for questions or	**10**

concerns that can be easily and quickly addressed.	
WRPS should continue efforts to revitalize the Peer Safety Observation Program as a means of encouraging and expanding worker involvement demonstrating managers' support for safety improvements.	**11**
WRPS should consider expanding the use of work teams involving both workers and managers to develop, rollout, and train workers on new processes or proposed organizational changes.	**12**
WRPS needs to identify and implement an effective working model to communicate best practices, successes, and failures between EAPCs.	**12**
WRPS should consider implementing a lower-level system, such as a worker concern logbook, that workers use and manage to identify worker concerns, document ideas for resolution, and review daily.	**13**
WRPS should revise the JHA process to capture the model described in OSHA publication 3071 2002 (revised), document the analysis and rationale for control selection, and provide additional hazard analysis training for personnel on that process to ensure consistent and thorough application.	**18**
WRPS should consider reviewing existing databases and information systems in use at the site for correlations and use as additional leading indicators and ensure leading indicators are appropriately published and communicated to the workforce.	**18**
WRPS should look to CVST as a model to emulate and attempt to recreate that worker involvement and trust in current areas of concern; i.e., the work control process.	**20**
WRPS should find additional means to communicate sample results to workers, provide workers additional training to better understand the technical basis for the IH sampling program, and help workers develop confidence in the safety and health staff.	**20**
WRPS managers need to demonstrate a highly visible commitment to performing work correctly despite any schedule pressures and ensure they do not create opportunities for workers to raise concerns regarding managers related to procedure compliance or safety.	**21**
WRPS needs to complete the maintenance program reevaluation as quickly as possible and establish a plan to reduce remaining backlog to a manageable level.	**22**
WRPS should ensure decisions to remove equipment from current PM schedule are documented and analyzed, and communicate that analysis to the workers.	**22**
WRPS needs to develop a program to identify equipment that is no longer in the inspection and calibration program by labeling them "DO NOT USE" or	**22**

convert back to a labeled inspection program that identifies properly maintained equipment.	
WRPS needs to accelerate implementation of the 8-week rolling schedule as a means of removing barriers to safe and efficient work completion.	**22**
WRPS needs to ensure methods of communicating safety-emphasis messages to workers are effective in making workers aware of those trends.	**23**
WRPS should consider utilizing experienced, restricted-duty tank farm workers to mentor newly hired work planners in the development of work packages during their restricted duty.	**24**
WRPS needs to revise the PER training materials and methods to ensure workers understand how to access the PER system and its purpose and ensure they are proficient in its use.	**28**

I. INTRODUCTION

The Hanford Site tank farms contain approximately 57 million gallons of radioactive and mixed waste stored in 177 large, aging, underground tanks. This nuclear waste is the result of more than four decades of reactor operations and plutonium production for National defense. The systems and infrastructure that support storage of the waste are aging and pose a threat to the environment. The solution to this problem is to safely and cost effectively retrieve, process, and immobilize this waste and to execute the compliant closure of the tank farm system so that it no longer poses a threat to the environment.

The Department of Energy's (DOE) Office of River Protection (ORP) manages the cleanup of the Hanford Site tank waste. In July 2008, DOE-ORP awarded the Tank Operation Contract (TOC) to Washington River Protection Solutions (WRPS), replacing the former tank operations contractor. The operational phase of the WRPS contract went into effect on October 1, 2008. The scope of the tank operations contract includes: Base Operations of the tanks, Analytical Laboratory Support, Single-Shell Tank Retrieval and Closure, Waste Treatment Plant Support, and Supplemental Treatment.

The previous tank farm contractor had achieved DOE-Voluntary Protection Program (VPP) Star status for two of its projects now under TOC. Those projects were Analytical Technical Services responsible for facility operation and support of the 222-S Laboratory, and Waste Feed Operations now under Base Operations. As a result of the new contract, WRPS has developed and submitted a new application representing all the WRPS projects under one application for entrance into DOE-VPP.

WRPS utilized the 2009 annual self-assessment to assess employee opinions of unifying the two Star projects into one. The review demonstrated employee and union leadership approval with that action. WRPS conducted and successfully completed an Integrated Safety Management System (ISMS) review in 2009 as well.

WRPS now consists of three operational line organizations: (1) Base Operations, including the 222-S Laboratory; (2) the Single-Shell Tank Retrieval and Closure project; and (3) Tank Farm Projects. These organizations are responsible for safe and environmentally compliant operation, maintenance, radiological control, project management, construction, work management, and industrial hygiene for 149 single-shell tanks, 28 double-shell tanks, and the 242-A Evaporator in the Hanford Site's 200 Area and associated facilities. A fourth line organization provides support to the Waste Treatment Plant (WTP). Several functional organizations then provide engineering, safety, quality, project management, human resources, and other common corporate support services to each of these organizations. Under TOC, WRPS has significantly expanded the scope of its VPP application, increasing from 700 to approximately 1,600 employees. WRPS bargaining unit workers are represented by the Hanford Atomic Metal Trades Council (HAMTC). HAMTC fully supports the DOE-VPP process.

WRPS workers contend with numerous environmental, industrial, and construction hazards, as well as radiological and chemical hazards (including exposure to potentially hazardous chemical vapors emanating from the tank waste and beryllium exposure). Industrial hazards include electrical, mechanical, scaffold work, and working with overhead loads. Also, potential nuclear safety hazards receive due consideration during tank-to-tank waste transfer activities.

In December 2008, WRPS notified the Office of Health, Safety and Security (HSS) of its commitment to continue participation in DOE-VPP. They further communicated that they believed the changes under the new contract would not significantly affect the existing organizations that had already achieved Star status and requested to retain recognition under the transitional process outlined in an August 2008 memo from the Chief Health, Safety and Security Officer. Under that process, WRPS was required to: (1) establish new written commitments by both management and labor consistent with the five tenets of VPP; (2) identify aspects of the existing VPP that would be evaluated for change; (3) develop a formal action plan to transition from the current to the revised (new contract) VPP; and (4) submit a revised application in a timeframe that enabled scheduling of an onsite evaluation by the HSS DOE-VPP Team (Team) within 24 months of the contract transition. HSS received the application and scheduled the onsite review for November 1-12, 2010. This report documents the results of that onsite review.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (WRPS)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	DART* Cases	DART* Case Rate
2007	2,321,713	14	1.21	7	0.60
2008	2,400,881	16	1.33	6	0.50
2009	2,802,223	9	0.64	5	0.36
3-Year Total	7,524,817	39	1.04	18	0.48
Bureau of Labor Statistics (BLS-2009) average for NAICS** # 562 Waste management and remediation services			5.2		3.3
Injury Incidence/Lost Workdays Case Rate (WRPS Subcontractors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2007	153,851	0	0	0	0
2008	121,467	1	1.65	1	1.65
2009	20,438	0	0	0	0
3-Year Total	295,756	1	0.68	1	0.68
Bureau of Labor Statistics (BLS-2009) average for NAICS** #562 Waste management and remediation services			5.2		3.3
Total WRPS and Subcontractors (3 Years)			1.02		0.49

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

TRC Incidence Rate, including subcontractors: 1.02
DART Case Rate, including construction and subcontractors: 0.49

WRPS accident and injury rates are significantly below the average for their comparison industry. These numbers reflect excellent safety and health performance. Review of the accident and injury logs did not identify any concerns regarding improper case management, incorrect classification, or underreporting of injuries. As of October 2010, the TRC rate for WRPS was 0.8, indicating a small increase in recordable injuries. The Team's review of the past several years of injuries and illnesses identified a trend in lower hazard slips, trips, hand/finger incidents, walking working surfaces, etc., at WRPS, which may be the primary cause of this increase. WRPS had identified this trend during the summer of 2010 and initiated a focused safety campaign on hand, finger, and arm safety that included targeted communications during safety and tailgate meetings, as well as ergonomic assessments. Interviews and work observations by the Team during this assessment indicated most workers did not recall this campaign, indicating WRPS may need to find more effective methods to promote safety campaigns and messages.

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.

WRPS managers are clearly committed to establishing and maintaining a safe work environment for all workers. All managers interviewed understood that safe performance of work was essential to mission success. Three specific work groups: the 222-S Laboratory; the Single-Shell Tank Retrieval and Closure group; and the Tank Farm Projects group, were functioning very well as a team. The managers in these groups were clearly present and visible to their workforces, and the workers were proud of their accomplishments.

WRPS has made sufficient resources available for worker safety and health. Resources for safety (industrial hygiene and industrial safety) are assigned in sufficient numbers to ensure appropriate sampling is performed and appropriate expertise is available when needed. WRPS has also provided ample resources for recognition and promotion of safety improvements, including investments from both DOE and the parent companies. In some cases, workers may not fully understand their performance incentives and believe that their annual performance incentive is tied to a specific TRC or DART case rate goal. WRPS has tried to implement a performance incentive plan that factors in both safety and contract performance, but that has not been effectively translated into specific actions that workers can take to achieve the contract performance and safety objectives. WRPS should revise the performance incentives program to clearly identify to workers those actions they should perform in order to earn periodic performance incentives.

Opportunity for Improvement: WRPS should revise the performance incentives program to clearly identify to workers the actions they should perform in order to earn periodic performance incentives.

WRPS has a formal process for managing subcontractors. That process ensures subcontracts contain appropriate requirements per title10, Code of Federal Regulations (CFR), part 851, *DOE Worker Safety and Health Program*, and also includes review of the qualifications of each subcontractor. Subcontractors are also required to designate a dedicated safety representative for the contract. Specific requirements, including safety requirements, are documented in the special conditions section of contracts. These subcontracts contain standard and special provisions, including the appropriate DOE Acquisition Regulations, depending upon the magnitude and complexity of the task order.

A Buyer's Technical Representative (BTR) for services or Cognizant Engineer is assigned to act as the day-to-day technical representative by the requisitioning organization, activity, or cost account manager. The primary duty of BTR or Cognizant Engineer is to provide technical

direction/clarification to the subcontractor to ensure performance of all elements is in accordance with the statement of work without placing emphasis on schedule or cost to the detriment of quality, safety, or the environment. The BTR/Cognizant Engineer is responsible for internal coordination of, and interface with, the subcontractor regarding the various technical requirements, such as quality assurance, safety, health, security, environmental, Price Anderson Amendment Act, and ISMS principles applicable to the performance of the contract pursuant to TOC implementing procedures.

The TOC Environmental, Safety, Health, and Quality (ESH&Q) organizations provide subcontractor management support to BTR. This includes communicating requirements and performing assessments, inspections, and/or surveillances to ensure compliance in accordance with TFC-PLN-116—Subcontractor ESH&Q Field Oversight. Oversight inspections are well documented in the Problem Evaluation Report (PER) system. Safety surveillances are entered into the field surveillance database and trended to assist in development of accident prevention strategies. Trending data information is incorporated into tailgate meetings and prejob meetings. Observation of work by subcontractors indicated these mechanisms have been effective in ensuring subcontractors meet the requirements of 10 CFR 851.

When WRPS managers assumed responsibility for TOC in October 2008, they inherited a workforce that has faced numerous challenges over the preceding years. Allegations and workers' concerns over the health effects of vapors from the tanks, beryllium, and a legacy of environmental effects over the past decades all factor into a workforce that is very suspect of changes. Yet WRPS was expected to make changes in the operations at the Hanford tank farms to increase worker accountability, reduce operating costs, accelerate the cleanup mission, and establish the systems, policies, and procedures that will be needed to support startup and operations of WTP, currently estimated to begin operation in 2018.

The previous contractor had allowed individual project areas to apply as independent participants in DOE-VPP. As a result, WRPS inherited two Star participants: the 222-S Laboratory and the Waste Feed Operations projects. The Closure Operations Project was prepared to apply to DOE-VPP when a spill of tank waste occurred, and the application was never submitted. The administrative and engineering groups were not participants and were not preparing to be participants. WRPS believed that, with two existing Stars and one project ready to apply, it would not need to make significant changes to the programs and procedures affecting the safety programs and would be able to use the transition process to retain the DOE-VPP Star status and combine the entire company into a single DOE-VPP Star participant.

For the first 12 months of the contract, WRPS focused on completing an ISMS verification by ORP and determining what changes would need to be made in order to meet the contractual goals. Over those first 12 months, WRPS determined that changes needed to be made in work planning and control systems, overtime practices, and worker accountability for work hours. For example, per the contract, WRPS must limit overtime to 10 percent or less. The previous contractor had overtime of approximately 25 percent, and workers had become accustomed to significant overtime pay. WRPS managers significantly reduced overtime hours and began holding workers accountable for either late arrival or unscheduled absences. In the second year of the contract, WRPS had made several significant changes to the work planning and control process. These changes have been in response to both internal and external reviews by WRPS, ORP, HSS, and the Defense Nuclear Facilities Safety Board (DNFSB). These changes have been intended to clarify the planning process, improve hazard analysis, and ensure work can be accomplished safely and efficiently.

WRPS has reorganized the workforce to better reflect its contractual performance goals. Those areas responsible for significant performance incentives have been established as standalone projects (Single-Shell Tank Retrieval Closure, and Tank Farm Projects). Base Operations, responsible for the day-to-day monitoring and preventive maintenance (PM), has been split into four geographically based teams and a dedicated "transfer team." Under the previous contractor, while there had been separate geographical teams, some craft personnel were not assigned to the teams, but rather worked from a central craft shop. WRPS reinstituted the teams, but also assigned the crafts people to the teams.

Although well intentioned and certainly justified, WRPS has not successfully involved the workforce in implementing these changes, and as a result, implementation of many of these changes has not fully matured. This has been repeatedly identified in both internal and external reviews. The Team heard comments from many workers expressing their concern and dissatisfaction with what they perceived as a management-driven effort to achieve VPP Star status, rather than a teaming or partnering approach. WRPS assembled a well-qualified and experienced team of senior managers from around the DOE complex, but they had very little experience with the tank farm workforce. In some cases, these managers wanted to implement changes that had worked at other DOE sites, but failed to gain workforce acceptance and trust prior to implementing those changes. The reduction in overtime hours especially resulted in some very unfavorable worker attitudes, particularly in projects that have had their approved overtime essentially eliminated.

Mature implementation of ISMS is necessary in order to demonstrate, not just compliance with DOE expectations, but the excellence in safety and health necessary for DOE-VPP Star recognition. ORP required WRPS to complete an Integrated Safety Management (ISM) verification as part of the new contract. That review was completed in August 2009 with 6 "level 2" findings (required a corrective action plan), 9 "level 3" findings (no corrective action plan required), and 10 observations. The ISMS verification report summarized the issues raised as:

> *The processes and policies governing procedure development, procedure change, procedure level of detail, procedure level of compliance, and expected level of worker comprehension of work step, hazards and controls do lend to inconsistency between good ISM and Conduct of Operations principles, management expectations and performance in the field.…The current system fosters inconsistent compliance with controls that could lead to accidents or injury.*

That same review identified that *the WRPS self-assessment and oversight program needs improvement.*

In March 2010, DNFSB issued a letter to Dr. Inés R. Triay, Assistant Secretary for Environmental Management, that expressed several concerns with both the scope of the DOE ISMS review of WRPS and the WRPS implementation. In September 2010, ORP performed an annual ISMS review of WRPS that noted improvements in ISMS implementation and concluded that *ISMS functions and principles have been effectively described in WRPS's and ORP management systems and ISMS has been effectively implemented. WRPS generally complies with the mechanisms discussed in the WRPS ISMS Description (ISMSD) document. The practices and mechanisms observed during the conduct and/or planning of actual work are in*

keeping with the principles of Integrated Safety Management. That report also identified continuing issues with level of detail in work control and hazard analysis procedures and rigor of integration of hazard controls, including a recommendation that WRPS and ORP *establish an agreed to set of visible compensatory/corrective actions that are established until criteria are met…* Those compensatory actions had not yet been agreed to as of this DOE-VPP review.

The sum of these reviews, both internal and external, as well as observations made during this DOE-VPP review discussed later in the Worksite Analysis and Hazard Prevention and Control sections, indicates that while WRPS has implemented the basics of ISMS and is continuing improvements, the implementation has not yet matured to the level of excellence expected of a DOE-VPP Star site. WRPS must resolve the identified issues in these reviews, stabilize the processes and procedures, and ensure workers fully understand, agree with, and implement those processes and procedures.

Opportunity for Improvement: WRPS needs to resolve issues identified in the past external and internal reviews of its ISMS, stabilize the work planning and control processes and procedures, and ensure workers fully understand, agree with, and implement those processes and procedures.

In some cases, middle managers, retained from the previous contractor, may have had difficulty through the transition process as well. A number of employee concerns were raised in the past 12 months alleging that managers or supervisors had established a "hostile working environment." Several of these concerns were either substantiated or partially substantiated by the WRPS employee concerns manager. Although not prevalent across the site, there were enough concerns identified to feed rumors and affect many workers' attitudes toward their managers. Based on interviews with senior and middle managers, it is also possible that a few workers have become so disenchanted with their managers that they are intentionally creating situations to foster discontent. In some cases, WRPS managers and supervisors have allowed themselves to react in ways that set themselves up for employee complaints. These conditions were most evident in Base Operations, but the Team interviewed workers from other project areas that had similar concerns. It was observed by the Team that in some cases the workers were contributing to what could be considered a hostile work environment through the use of antagonistic actions and foul language. While it is clearly inappropriate for anyone to contribute to a hostile work environment, WRPS managers must not allow themselves to be pushed into a situation where the workers subsequently have a basis for filing an employee concern about hostile working environments.

Opportunity for Improvement: WRPS managers, supervisors, and workers all need to commit to eliminating any appearance of a hostile work environment, and ensure those that will not make such a commitment are held accountable.

Another expectation of DOE-VPP Star sites is an effective process to establish challenging safety and health improvement goals. WRPS has established annual safety Performance Objectives, Measures, and Commitments (POMC) through the contract with ORP. These POMCs are used by ORP to determine WRPS award fee on an annual basis. Additionally, each Employee Accident Prevention Council (EAPC) establishes its own annual goals. In most cases, the linkage between the goals established by EAPCs, POMC, and the issues identified in the multitude of internal and external assessments was not clear. Additionally, the goals established

by EAPCs lacked specificity, making it difficult to determine when a goal was met. Finally, these goals are not clearly integrated into individual employee performance evaluations. WRPS should work toward full integration goals between POMC and EAPCs and find ways to link employee awards and incentives to actions that help meet those goals.

Opportunity for Improvement: WRPS should work toward fully integrating goals between the POMC and the EAPCs and find ways to link employee awards and incentives to actions that help meet those goals.

In order to affect a change in the workers' acceptance and trust, WRPS will need to make a concerted effort in the coming months. In order to accelerate integration and effectiveness of the Area Teams in Base Operations, WRPS should identify and implement specific team building opportunities. These opportunities might include specific team building training, creating specific team targets and goals, celebrating achievement of those targets, and getting the teams involved in designing and implementing improvements to their facilities (lunchrooms, change and shower facilities).

Opportunity for Improvement: WRPS should identify and implement specific team building activities and training for the Area Teams in Base Operations.

In order to eliminate and prevent any appearance of a hostile work environment, workers, supervisors, and managers must all commit to performing work the right way, despite delays, inconvenience, or perceived schedule pressure. At the same time, workers, supervisors, and managers must work together to optimize work control processes and their implementation to ensure work is safely and efficiently performed. Managers must make themselves present and available to the workforce in the workspaces. Management presence in the field is tracked as one of the fiscal year (FY) 2011 POMC. To meet that criterion, managers are only expected to perform one workplace observation per month. The Company President intentionally schedules two 4-hour timeslots each week to perform workplace visits, but many managers are only minimally visible to the workforce. Other managers should follow the Company President's lead and significantly increase their presence in the workspaces beyond the one observation per month in order to establish effective working relationships with the workers.

Opportunity for Improvement: WRPS managers should significantly increase their presence in the workspaces beyond the one observation per month in order to establish effective working relationships with the workers.

To help managers to more effectively prepare for future changes, WRPS should identify training for managers on change management strategies. This training should include how to identify personnel that have not accepted change, strategies to gain that acceptance, and ensure workers' input is actively sought in defining and implementing changes.

Opportunity for Improvement: WRPS should indentify and implement training for managers on effective change management strategies and ensure worker input for future changes is actively sought and used.

One worker identified that the previous contractor had used an Employee Response Team to help deal with stressful workplace changes, primarily layoffs. That team consisted of a bargaining

unit employee, a technical exempt employee, and an engineer. This team listened to employee concerns/issues during the layoff time period and made recommendations to managers, Legal, Human Resources, and Labor Relations. The interviewee recently suggested to WRPS that such a team be reinstituted for current issues related to the restructuring of Base Operations. WRPS should consider this concept not just for Base Operations but for the company as a whole as another tool to help identify, communicate, and resolve workers' concerns related to the changes being made.

Opportunity for Improvement: WRPS should consider reinstituting Employee Response Teams to help identify, communicate, and resolve workers' concerns related to the changes being made.

A key element of DOE-VPP is an effective annual self-assessment that is used to identify and implement performance improvements for the following year. While WRPS has performed self -assessments during the transition period, those assessments have not been sufficiently self-critical to identify and correct conditions observed by this Team. Although performed by worker-led teams, the self-assessments relied heavily on survey type questions. While those opinions are important, the self-assessment process must also use more performance-based observations of how effectively systems and processes are implemented at the working level. This process must incorporate soliciting workers' ideas on needed improvements and needs to be used in establishing specific safety improvement goals for the coming year.

Opportunity for Improvement: WRPS needs to implement an effective, performance-based element to its annual VPP self-assessment and ensure the assessment is sufficiently self-critical and performance-based to identify improvement opportunities and establish specific safety improvement goals.

Other improvements to consider might include more workers, supervisors, and managers performing cross-organizational observations and assessments or intra-organizational mentoring (e.g., between the Single-Shell Tank Retrieval and Closure Team and the dedicated Tank Transfer Team). This could help foster a better understanding between organizations, as well as greater consistency across the organization in implementation of work control processes.

Opportunity for Improvement: WRPS should implement a process to provide for cross-organizational observation and mentoring for workers, supervisors, and managers as a means of breaking down organizational barriers, sharing lessons learned and experiences, and encouraging more consistent implementation of safety processes and procedures.

Another essential element is the process whereby workers can stop work. DOE has required all contractors at the Hanford Site to use a common stop-work procedure. That procedure does not include a graduated approach, beginning with a process that encourages workers to "step back" or "pause" to ask questions before resuming work. Such a process has proven very effective at other DOE-VPP participant sites by establishing a more deliberate approach by workers to the task at hand. By encouraging workers to step back and clarify any questions or concerns, other participants have been able to identify and address worker concerns while simultaneously encouraging efficient performance of work. WRPS should work with HAMTC, ORP,

DOE-Richland, and other site contractors to ensure that workers not only have the right and ability to stop work, but also a means to pursue a less restrictive process for questions or concerns that can be easily and quickly addressed.

Opportunity for Improvement: WRPS should work with HAMTC, ORP, DOE-Richland, and other site contractors to ensure that workers not only have the right and ability to stop work, but also a means to pursue a less restrictive process for questions or concerns that can be easily and quickly addressed.

Conclusion

There is no doubt that WRPS managers are firmly committed to establishing a safe and healthy work environment. WRPS has not yet effectively translated that commitment into a mature, effective, working partnership with the workforce. Many changes made in the previous 2 years have been made without ensuring worker input and concerns are adequately addressed, and the workforce has not effectively committed to those changes. WRPS managers are struggling, in some cases, to overcome many years of workers' previous history at the tank farms. Efforts to achieve more efficient performance and increase accountability have, in some cases, been stymied by workers who feel disenfranchised and mistreated over the years. Some project areas, such as the 222-S Laboratory and the Single-Shell Tank Retrieval and Closure Operations, are functioning much better and should be considered as a model for other areas that are struggling to implement excellence in safety and health programs. WRPS managers must be more proactive in reaching out to the workforce to gain its trust and acceptance in order to achieve 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.

The Team identified some areas where employee involvement was particularly effective. The North and South EAPCs demonstrated a strong safety culture and are comfortable in raising concerns to management. The South EAPC, in particular, has a very active employee group, participates in meetings, volunteers for safety-related activities, and has initiated safety campaigns (traffic safety, seatbelt use, use of crosswalks, and use of handrails) for its group. Of particular note, the 222 S Laboratory has a very engaged workforce as demonstrated by its committee participation, field observations, and safety campaigns. Workers and managers on the Single-Shell Tank Retrieval and Closure project have worked closely together to develop and implement solutions to difficult problems (see Worksite Analysis).

Employees, in general, are aware of their role when it comes to safety and health. They look out for themselves and for their coworkers on a daily basis. Employees understand the safety requirements. They understand that the procedures are in place to help keep them safe, and they know how to recognize the hazards and ensure that these hazards are addressed. A mechanism used by WRPS to facilitate workers looking out for fellow worker's safety was the Peer Safety Observation Program. This program was in place previously at the tank farms, but since the contract transition, has not been effectively utilized by WRPS. WRPS identified this as an improvement initiative as part of its VPP readiness plan. WRPS should ensure this program is used as a means of garnering more employee involvement and encouraging them to expand the existing culture of "watching out" for others. Revitalization efforts might include small incentives and recognition for reporting observations and ensuring employees welcome realtime feedback from those observations.

Opportunity for Improvement: WRPS should continue efforts to revitalize the Peer Safety Observation Program as a means of encouraging and expanding worker involvement demonstrating managers' support for safety improvements.

WRPS has struggled with expanding employee participation and support when new programs, initiatives, procedures, and other company-wide mechanisms are implemented. Workers broadly view the safety and health program and the effort to achieve DOE-VPP recognition as a management-driven program, lacking employee input and involvement. Managers agreed that labor could have been more involved in the development of new and revised processes and procedures to get employee acceptance and support prior to the implementation of program changes. Adding to these difficulties, Base Operations was reorganized without sufficient labor involvement and effective coordination causing resistance and a lack of employee ownership and buy in. As a means of gaining additional worker involvement and support for program and organizational changes, as well as promoting a greater sense of teamwork between workers and

managers, WRPS should consider forming work teams involving both workers and managers to develop, roll-out, and train workers on new processes or proposed organizational changes. The effectiveness of this teaming approach was evident in the success of the Chemical Vapor Solutions Team (CVST) discussed later in Hazard Prevention and Control. This collaboration allowed for better analysis of the vapors in the farms, new equipment to be developed to reduce and/or eliminate exposures to employees, and provided a positive teaming atmosphere for management and labor.

Opportunity for Improvement: WRPS should consider expanding the use of work teams involving both workers and managers to develop, rollout, and train workers on new processes or proposed organizational changes.

During the review, a marked difference was noted during the onsite observations and interviews conducted with employee committees. While the North, South, and 222-S Laboratory EAPCs were effective, the other safety committees observed had poor worker participation, a lack of safety initiatives, lack of employee recognition, and low employee perception that their EAPC could result in positive safety changes for their work area. Employees mentioned that their EAPC was not well attended due to the lack of support and incorporation of safety ideas from the workers. The lack of communication between managers and the workforce has resulted in a perception by the workforce that its opinion is not sought regarding safety decisions.

Employee committee rosters and employee interviews confirmed that employees are not fully engaged in the EAPCs in all areas. Personnel indicated that they were afforded the opportunity to attend meetings. However, they either choose not to or did not believe that their attendance would make a difference. Others interviewed indicated that due to schedule impacts, they were not able to attend these meetings.

Managers and workers alike often described “stovepipes” in the organization as a problem. A large contributor to the stovepipes and inconsistency of implementation of the safety and health program and employee involvement is the lack of coordination between EAPCs. Each committee acts as an independent entity. EAPCs are not effectively sharing best practices and successes among committees. The President’s Accident Prevention Council does meet but has not yet been effective in facilitating this coordination between EAPCs. In May 2010, the ESH&Q organization was reorganized in an effort to help reduce the stovepipes and improve consistent implementation. That reorganization is maturing, but needs time to become effective. WRPS needs to find a working model to share information between EAPCs to engage each group. Each of the EAPCs must be intimately involved with identifying and implementing this model. Employee suggestions to drive this process improvement should be actively sought, encouraged, and recognized.

Opportunity for Improvement: WRPS needs to identify and implement an effective working model to communicate best practices, successes, and failures between EAPCs.

WRPS has encouraged workers to identify and document hazards identified on the jobsite. The PER system provides one mechanism for documenting, evaluating, and tracking to closure any issues. Recognizing the importance of this system, WRPS requires all personnel to be trained and familiar with the system prior to use. It is an expectation that all WRPS employees understand how to use the PER system (see Training for discussion of training effectiveness).

Based on issues currently in the system, many workers are using the PER system. However, followup with employees on the resolution of their issues, in some cases, remains problematic.

The PER system allows for several months to address issues. When timely resolution is not attained through the PER system, employees resort to a stop-work to get the issues resolved, in some cases, forwarding the same issue to the DOE Facility Representatives for resolution. This continues to reinforce the perception by workers that the safety and health program implementation is poor and management support of employees is very low. A review of the PER system demonstrated cases lacking a documented response and ineffective followup with the employee who identified the issue. This contributed to some employees' perceptions that their concerns languished in the PER system or were not being addressed. Additionally, some employees believed that they received negative feedback from direct supervisors when certain issues were entered into the PER system that could cause a delay in accomplishing work. If employees are not included in the corrective action identification, it gives the appearance that their issues are not being worked or addressed which may lead them to escalate the issue through other means (stop-work, employee concerns, etc.).

In recognition of past problems with implementation of the PER process, WRPS requested an onsite assistance visit from the Institute of Nuclear Power Operations to evaluate the PER system in January 2010, and a Value Engineering Study in February 2010 with worker involvement. The issue of worker feedback in the PER system is well documented in the resulting PER Improvement Plan. As part of the response to the issue, WRPS hired a special "PER Ombudsman" in August 2010 to ensure communication has occurred on each PER where feedback was requested by the originator. Although these changes are now in place, they need time to demonstrate effectiveness.

The PER system was the only realtime mechanism observed during the review to document issues in the field, during walkdowns, and surveillances. As a possible improvement, WRPS should consider implementing a lower-level system, such as a worker concern logbook, that workers use and manage to identify worker concerns, document ideas for resolution, and review daily. This system would document lower-level concerns or issues that can be readily corrected locally, provide a means for the worker to suggest resolution actions, and track closure. This logbook can be reviewed on a daily basis with managers and work crews at the beginning of each shift and shared with other work groups to help with identification and resolution of similar issues. This should be employee-owned to help assist with employee ownership of the safety program and provide a mechanism for employee pride and contribution to safety improvements.

Opportunity for Improvement: WRPS should consider implementing a lower-level system, such as a worker concern logbook, that workers use and manage to identify worker concerns, document ideas for resolution, and review daily.

Conclusion

WRPS has retained the primary means of encouraging employee involvement through the transition process. Some EAPCs are functioning very effectively to encourage worker ideas and resolve worker issues. EAPCs representing the bulk of the bargaining unit workers have seen a reduction in employee participation. Managers and workers have not yet consistently worked together to share positive lessons learned and experiences between EAPCs. Employees' attendance at EAPC meetings has dropped, particularly among the bargaining unit, and some

workers and managers have not developed sufficient mutual trust and respect to form teaming relationships. Overall, direction and guidance to EAPCs has not been effective in developing a consistent teaming approach. Additional recognition and encouragement of workers to raise concerns and proactively assist managers in developing campaigns and initiatives will help raise safety awareness and reverse negative trends. Both managers and the workers must develop a path forward to communicate and implement a proactive teaming approach to safety that allows and encourages employees to take ownership of the safety program to move to the Star level.

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.

WRPS has a documented system that captures the hazards encountered by workers as they perform job functions in the tank farms. WRPS industrial hygiene (IH) personnel received the database and information gathered by the previous contractor and developed a strategy for evaluating and sampling for hazardous material throughout the tank farm complex. This strategy has been independently evaluated and is consistent with industry practices. The baseline survey of health and safety hazards has been documented for all facilities. Chemical, vapor, radiological, nuclear, and industrial safety hazards have been assessed and are updated on a routine frequency. Trained and qualified safety and health technicians/professionals manage the survey programs in their respective safety discipline to update the hazard data. TFCPLN- 43, *Tank Operations Contractor Health and Safety Plan*, is organized according to subject matter and presents general information relevant for the planning and conduct of work at all tank farms and associated facilities. This information establishes baseline health and safety guidelines. Facility-specific information is provided in RPP-13033, *Tank Operations Contractor Documented Safety Analysis*.

Baseline evaluations of worker exposure to tank-generated vapors in the tank farms are well documented and identify and quantify tank emissions at the source and potential work area exposures. These evaluations were used to characterize potential exposure in all farms. This data is also used in developing similar exposure group data for IH exposure assessment strategies. Baseline exposure data for the tank farms is kept in the Integrated Data Management System, which also serves as the DOE long-term storage of electronic records.

Although physically separated from most of the tank farm work, the 222-S Laboratory continues to excel and improve its in-house processes to identify, mitigate, and manage the hazards associated with its work scope. The Base Operations group exhibited a strict adherence to the documented processes provided by WRPS. Workers interviewed in Base Operations had no qualms about stopping work when new or unidentified hazards were found or questions arose regarding controls.

The Single-Shell Tank Retrieval Project typically performs some of the most hazardous activities within the Hanford tank farm complex, and workers there recognized the need for more rigorous evaluation of hazards and controls. Managers and workers in this project have teamed to address the needs associated with these activities and developed solutions together. For example, when issues are identified related to performance of a task, the appropriate personnel are immediately available to visit the worksite, review the issue, identify solutions, and make necessary changes to the work documents allowing work to proceed safely. The Team observed a Single-Shell Tank Retrieval Project prejob review meeting with all craft, safety-support personnel, and supervisors in attendance. The meeting consisted of defining personnel roles and

responsibilities, and discussing precautions, limitations, critical steps, controls, and contingencies. It included detailed step-by-step work instructions, hazards associated with each task, radiological and IH hold points, and lessons learned from previous stop-work activities from other projects. Detailed requirements for Personal Protective Equipment (PPE) use, access control, and continuous support coverage were also discussed. Single-Shell Tank Retrieval Project also uses a Joint Review Group process for high hazard work usually associated with High Radiation Areas. This review group, including craft, support personnel, management and supervision, serves as similar functions of a readiness review. Work proceeds once all participants have resolved any questions or issues. These teams need to be cautious that this joint teaming approach does not circumvent procedure change and review processes similar to what was observed by DNFSB in its January 2010 review.

In the area of long-range planning, the Team found that there was excellent coordination between WRPS planning group and the WTP Construction Project (Bechtel National, Inc). Regular meetings and coordination have been established to ensure that concurrent processes by both facilities (tank farms and WTP) have the end use goal in mind and can be effectively executed. By identifying issues and proactively addressing potential hazards and conflicts, the goal of seamless transfer of waste for treatment may be realized.

As discussed in the Management Leadership section, WRPS work control and hazard analysis processes still exhibit opportunities for improvement and better integration. WRPS work planning instructions contained in TFC-OPS-MAINT-C-01, REV O-5, September 27, 2010, *Tank Operations Contractor Work Control* require a determination of "Level of Work." This is a graduated system that considers 14 different contributors and drives the level of work planning. The system, as designed, allows a person to make judgments on complexity, skill of craft, risk of exposure to energy source or hazardous material, necessity for detailed instruction, or existence of a General Hazard Analysis (GHA) or Job Hazard Analysis (JHA). Additional hazard analysis is performed if existing hazard analyses are not deemed adequate. Fundamentally, this is a sound process that uses hazard analysis to determine the level of work control and planning. This process was implemented in September 2010 and needs time to mature and for workers and planners to become proficient in documenting the basis for the decisions. A significant amount of work is expected to fall into the Level 3 and Level 4 categories. It is, therefore, essential that the GHA and any JHAs are sufficiently detailed to ensure personnel deciding that work is covered under these analyses can clearly and easily make that decision. As discussed in the following paragraphs, some of the existing hazard analyses used to support these decisions do not currently include sufficient detail in the hazard analysis and control selection. WRPS must also be cautious that decisions to conduct work as a Level 3 or Level 4 are appropriately supported and do not circumvent the processes designed to ensure work is performed safely.

WRPS is working to clarify the term "skill of the craft." This should significantly help with hazard identification, analysis, and control selection by clearly defining those controls that can be applied through worker knowledge and skill. Further benefits will be realized as work packages are developed with a set of criteria whereby the planner, supervisor, and workers can produce work documents with a common set of expectations.

The JHA process is documented in TFC-ESHQ-S_SAF-C-02, Rev F, June 30, 2010, *Job Hazard Analysis*, and provides a comprehensive process flow chart. Attachment A to that procedure contains "*Tank Farms General Hazards Analysis.*" This GHA contains rules to remind the workforce of surroundings, situational awareness, monitoring individual capabilities, and deliberate speeds, which are all good reminders especially in light of the climate extremes

workers can encounter during conduct of routine activities. After the reminders, the first example discussed in the general section is chemicals. The controls offered are: "Be trained on the specific chemicals you are using and ensure proper handling and storage of chemicals." The ensuing discussion indicates the worker should review the Material Safety Data Sheet (MSDS) or review the MSDS with an Industrial Safety specialist. A more effective approach would be to ensure a good hazard analysis has been performed on the use of those routine chemicals that includes information from the MSDS and a review by Industrial Safety and IH. The worker should then be directed in the GHA to refer to the specific hazards analysis for further information. That analysis should also be used to develop the specific chemical training. In another example, the hazard identified is Fire. In the control section it indicates "control the amount of combustibles" with a discussion of keeping combustibles as low as reasonably achievable (ALARA). While well-intentioned, the decisions for acceptable safety in these two cases are being left to the worker for further analysis with multiple variations possible. The procedure construct is vague and ambiguous with analysis and control selection left to individuals whose knowledge will vary.

In connection with JHAs, WRPS uses a checklist identified as "WRPS Job Hazard Analysis Checklist" as an example of hazard identification/analysis and control for work that is not procedure driven. *Tank Operations Contractor Work Control* specifically requires work packages to be initiated, planned, assembled, and performed by service organizations (e.g., Fire Systems Maintenance, Refrigerated Equipment Service) to utilize the checklist. The first column in the checklist, as explained to the Team, is for generic type hazards/tasks for which the user checks "yes" or "no." Some examples are overhead utilities, noise greater than 85 dBA, ladder and scaffold use, confined space, radiological, and ergonomic. The second column is "activity/task analysis." The third column is identified as "method" that includes skill-based, precaution/limitation, warning, work instruction, permit/plan, or prejob brief. Using the example of ladder/scaffold use for replacement of the heating, ventilation, and air-conditioning unit at 222-S Laboratory, the analysis section indicates inspection of ladders/scaffolding, current inspection, proper ladder size, proper position, and safe practices will be followed. The task identified for this is "general scope" not individual work steps. The methods of implementation of the analysis are skill-based and prejob briefing. The Team attended the prejob brief, which did not address why controls were there, what the controls were, and how they would be implemented. The Team found the JHA attached to the work package to be adequate and complete for the work performed that day. The JHA checklist utilized is at best a preliminary identification of hazards and a basis for further analysis; it does contain the level of detail recommended by the Occupational Safety and Health Administration (OSHA) model contained in Pamphlet 3071, *Job Hazard Analysis*.

The level of detail and quality of JHAs has also been problematic for WRPS. The Team observed two WRPS teams performing a JHA walkdown on work to be performed. In one instance, the need for hearing protection was identified as nominally 50 feet from the operating machinery. Specific noise levels from the machinery were not monitored, referenced, or available to the personnel performing the walkdown to establish if the 50 feet distance was sufficient. On another JHA, the issue of ergonomic hazards was identified in relation to use of long-handled tools. These tools are employed as a dose reduction method. Although the team performing the JHA identified ergonomics concerns generically, no specific issues related to the use of long-handled tools were considered. Long-handled tools may introduce hazards to the workplace depending on how the tools are used and supported over their length. In these cases, verbal analysis was the sole method by which analysis was conducted, and these discussions were not adequately recorded or documented in the JHA. In contrast to JHA, ALARA review

for radiological work, the Electrical Hazard Analysis for electrical work, and the Chemical Hazard Analysis for work involving hazardous materials adequately document the associated analysis, including the logic for control selection and adequately communicate the information to the worker. Documentation of the analysis is essential to capture lessons learned, as well as use in the feedback and improvement process.

Opportunity for Improvement: WRPS should revise the JHA process to capture the model described in OSHA publication 3071 2002 (revised), document the analysis and rationale for control selection, and provide additional hazard analysis training for personnel on that process to ensure consistent and thorough application.

WRPS tracks and trends a variety of items associated with performance and safety indicators. For example, lockout/tagout events and injuries metrics and occurrences are tracked by issue type, reports per quarter, and Occurrence Reporting and Processing System reports. There is a safety-related backlog that is tracked monthly with PER to maintain a percentage reduction as a goal. Some leading indicators have been introduced, such as the number of hours spent performing management observations and senior management observations of field work, percentage of scheduled work versus emergent work, and number of significant, open EAPC issues. Goals for these indicators were established based on contract peformance incentives. The Team was not able to identify how monthly trend information was being communicated to WRPS employees. To help mature and refine the system of leading indicators,WRPS should consider reviewing existing databases and information systems in use at the site for correlations to other safety issues. WRPS should also consider other sources of leading indicators, such as the number of peer safety observations performed. As more data is gathered for current indicators, correlations should be established and used to evaluate current goals. Finally, WRPS should ensure leading indicators are appropriately published and communicated to the workforce.

Opportunity for Improvement: WRPS should consider reviewing existing databases and information systems in use at the site for correlations and use as additional leading indicators and ensure leading indicators are appropriately published and communicated to the workforce.

Conclusion

WRPS and the previous tank farm operating contractor established an effective technical basis that captures the analysis of the tank farm vapors, one of the primary safety concerns at the tank farms. CVST and industrial hygienists continue to work together to analyze the hazards and risks. WRPS is also working closely with the WTP Construction Project to ensure actions taken in the tank farms will not adversely affect eventual operation of WTP. Other primary hazards, such as radiation, mercury, and other chemical hazards are also well characterized and understood. WRPS needs to continue to address worksite analysis and work control weaknesses identified in multiple assessments. These improvements should be allowed to mature and stabilize before they are evaluated for effectiveness. Since there have been multiple changes to processes within the past year, the Worksite Analysis tenet of VPP cannot be considered met since they have not had sufficient time to mature.

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.

Properly designed engineered controls are normally more effective than either administrative controls or PPE. To that end, WRPS has implemented many excellent engineered controls to minimize worker exposures in the tank farm environment. The following are some examples.

- Extending the height of some of the ventilation stacks in the tank farms to reduce vapor exposures during temperature inversions. Extensive sampling and modeling of the vapor plumes has demonstrated significant reductions in vapor levels in the workers' breathing zone.

- Retrieval Construction engineering staff lowered the arc flash energy level at one tank farm by removing a 13.8 kv transformer and replacing it with a 480 volt transformer, thus reducing system voltage and fault currents, the potential for equipment damage, and the need for higher levels of PPE while working on electrical equipment.

- Valves in the tank farms are sealed or capped with remote devices developed to reduce the exposure to employees conducting sampling and maintenance on systems.

- WRPS is preparing to install the Mobile Arm Retrieval System (MARS) into tank C-109 to enable the removal of hard heels. The MARS system has been thoroughly tested by WRPS and mockups have been performed to limit worker exposure during the MARS installation into the tank.

Over the past several years, workers have been concerned regarding exposures to vapor emissions from the tanks. These vapors consist of many different chemicals resulting from radiolytic decomposition of organic chemicals used in the separation processes, fission products, and other chemicals added to the tanks over their history. In 2003, the previous contractor initiated CVST that continues under the current contractor. The team is comprised of workers, safety professionals, and managers. CVST has identified several solutions that help mitigate risks to workers' safety and health. Some specific items include implementing stack venting improvements, sealing tank openings and enclosures, providing for PPE improvements, such as optional respirator upgrading beyond procedural requirements, and increasing monitoring and the communication of those results. As a result of the vapor monitoring program, the use of Self-Contained Breathing Apparatus has been significantly reduced without risking additional exposure, thus reducing exposure to hazards inherent to its use. In Team interviews, workers commonly referred to CVST as a positive initiative that improved communication of the issues. Almost all workers interviewed agreed that they believed they were truly involved in the resolution of those issues they raised to CVST.

Opportunity for Improvement: WRPS should look to CVST as a model to emulate and attempt to recreate that worker involvement and trust in current areas of concern: i.e., the work control process.

WRPS has a qualified staff of safety professionals. The expertise consists of industrial hygienists, safety professionals, health physicists, and engineers. These personnel have the expertise to accomplish a variety of activities, including safety and health planning, policy and standards development, radiological control coordination, and injury/illness record keeping within the various organizations, as well as in the facilities. WRPS recently hired additional IH staff and other certified professionals to enhance the safety and health expertise in nonradiological work. Observations by the Team reinforced the availability of professional expertise to the workforce.

In order to validate that the appropriate controls are being used, WRPS has increased the frequency and level of personnel and area monitoring for chemical vapors during tank transfer work for the past 2 years. They have obtained specialized equipment to analyze samples and provide quicker results. These results provide the safety and health personnel the information they need to tailor the use of PPE where appropriate, either by reducing or increasing the level of PPE.

In some cases, interpretation of sample results, adequacy of controls, and the need for additional monitoring was not effectively communicated to the workforce. Some tank farm workers did not fully understand what these sample results meant or how they were used. Some workers did not trust that the safety and health staff was recommending the appropriate level of protection to employees. Reviews of sample data, procedures, and work practices by the Team demonstrated that safety and health personnel were using accepted industry standards and practices and making appropriate decisions based on the increased monitoring data. WRPS should find additional means to communicate sample results to workers, provide workers additional training to better understand the technical basis for IH sampling program, and help workers develop confidence in the safety and health staff.

Opportunity for Improvement: WRPS should find additional means to communicate sample results to workers, provide workers additional training to better understand the technical basis for the IH sampling program, and help workers develop confidence in the safety and health staff.

All WRPS employees are expected to comply with the Master Safety and Occupational Health Rules, which are contained in the Company-level safety and health policy, TFC-POL-14, *WRPS Safety and Occupational Health*. Managers and workers at every level are responsible and accountable for understanding and implementing established company standards for safety, ISMS expectations, environmental protection, quality, and efficiency, which are communicated via Hanford General Employee Training (HGET), the performance review process, and during routine employee communications and presentations.

However, some workers expressed the perception that managers were not being held accountable for not following those rules. Workers cited examples of supervisors instructing workers to perform only specific parts of procedures without additional review or control. The Team did not investigate individual examples, but recognized that workers' perceptions of managers' actions were having a negative effect on the worker-manager relationship. Performance of a

portion of a procedure without regard to the preceding steps, precautions, or limitations could lead to an unexpected system response, creating additional unanalyzed or uncontrolled hazards and is generally not permitted. WRPS managers need to ensure they demonstrate a highly visible commitment to performing work correctly for all employees despite any schedule pressures. This includes stepping back or stopping work to include work steps in a work package when appropriate.

Opportunity for Improvement: WRPS managers need to demonstrate a highly visible commitment to performing work correctly despite any schedule pressures and ensure they do not create opportunities for workers to raise concerns regarding managers related to procedure compliance or safety.

Backlogged PM in the tank farms has been a recurring concern of workers for several years. WRPS is in the process of reevaluating its PM program to remove unnecessary maintenance actions from the CHAMPS system and more effectively prioritize the remaining work. WRPS has used funding from the American Recovery and Rehabilitation Act to replace some aging tank farm equipment, and reevaluate the maintenance needs for existing equipment. The reevaluation process requires system engineers and maintenance groups to validate all current maintenance requirements in the previous contractor's system and to add PM for newly installed systems. During this reevaluation, the WRPS maintenance organization has opted to not perform some specific PMs in lieu of performing prestart checks of the equipment prior to operations.

Some tank farm maintenance workers expressed concern that this approach prioritized cost savings over safe operations and proper maintenance and reflected a decision to run to failure. The WRPS maintenance manager believes this is an acceptable practice during the PM reevaluation process. All Technical Safety Requirement-related equipment continues to be included in the PM program and is not subject to the precheck approach. Because of the sometimes infrequent use of some equipment of various tank farms, this practice is justifiable for a temporary basis as new equipment is being installed and other systems are evaluated for significance from the previous PM system. However, WRPS needs to ensure its decisions are well documented in its evaluations and they communicate those justifications to the workforce. In the meantime, WRPS must also seek and encourage workers to identify equipment that they are concerned about failing and ensure those potential failures will not lead to unacceptable consequences. This might include a labeling program for equipment that is overdue for maintenance and requires a maintenance check before use. WRPS needs to complete the maintenance program reevaluation as quickly as possible and establish a plan to reduce remaining backlog to a manageable level.

The previous tank farm contractor initiated a sticker/label-free inspection and calibration program, and WRPS adopted this process in the contract transition. This process was implemented because calibration stickers and labels did not hold up in the tank farm weather conditions. Because WRPS cancelled some PMs and relies on the preuse check process for some equipment, there is no longer assurance that the PM program is maintaining a particular piece of equipment as was previously assumed. Consequently, the effectiveness of the label-free inspection program is questionable. For example, during one work activity, workers were found monitoring a magnahelic gauge to assure negative pressure in the tank. However, the gauge they were reading had not been calibrated in 2 years. The magnahelic gauge was determined to be nonessential and had been dropped from the calibration and inspection program the previous year. Because of the label-free inspection program, workers assumed the gauge was still

functioning properly. WRPS needs to develop a system for identifying equipment and components no longer in the PM surveillance programs and ensure they are properly designated as such or convert back to a label surveillance program identifying equipment involved in the active surveillance program.

Opportunity for Improvement: WRPS needs to complete the maintenance program reevaluation as quickly as possible and establish a plan to reduce remaining backlog to a manageable level.

Opportunity for Improvement: WRPS should ensure decisions to remove equipment from current PM schedule are documented and analyzed, and communicate that analysis to the workers.

Opportunity for Improvement: WRPS needs to develop a program to identify equipment that is no longer in the inspection and calibration program by labeling them "DO NOT USE" or convert back to a labeled inspection program that identifies properly maintained equipment.

Delays in work execution based on work planning weaknesses have been endemic to the tank farm project. In addition to the changes in the work planning and control process discussed in the Worksite Analysis section, WRPS maintenance manager is developing an 8-week rolling schedule for work planning. The maintenance manager recognized that work execution delays result from a combination of poor resource scheduling and planning weaknesses and weather delays. By developing an 8-week rolling schedule, the maintenance manager should be able to more effectively plan for personnel and incorporate contingency work in the event of primary work delays. The planning for the 8-week rolling schedule was in development during this assessment. In order to facilitate implementation, the maintenance manager plans to work with system engineers, work planners, and HAMTC representatives to ensure all barriers are addressed in the development of this process.

Opportunity for Improvement: WRPS needs to accelerate implementation of the 8-week rolling schedule as a means of removing barriers to safe and efficient work completion.

Radiological controls observed by the Team were effective at minimizing the risk of contamination spread and personnel exposures. The radiological manager has full responsibility and authority over the radiological control program. Health Physics Technicians perform appropriate air sampling and surveys to ensure working conditions are fully understood. Sampling and survey data are used for ALARA reviews and preparation of the Radiological Work Permits to ensure appropriate control selection for the work. The Radiological Control Department conducts periodic mini drills to check knowledge level of the radiological control technicians using talk-through, demonstration and coaching methods. WRPS is purchasing newer survey and monitoring equipment and putting some equipment already on hand to better use. The radiological control manager visits technicians frequently to encourage open communication. The radiological controls manager is considering a pause in radiological work this winter to provide an opportunity for all WRPS radiological controls personnel to meet and discuss issues and concerns that directly affect their work scope.

The Team review of the past several years of injuries and illnesses identified an upward trend in lower hazard slips, trips, hand/finger incidents, walking/working surfaces, etc., at WRPS. WRPS had identified this trend during the summer of 2010 and initiated a focused safety campaign on hand, finger, and arm safety that included targeted communications during safety and tailgate meetings, as well as ergonomic assessments. Interviews and work observations by the Team during this assessment revealed no awareness by workers of this campaign, indicating the methods used to promote the message were less than effective. WRPS needs to ensure methods of communicating safety-emphasis messages to workers are effective in making workers aware of those trends.

Opportunity for Improvement: WRPS needs to ensure methods of communicating safety-emphasis messages to workers are effective in making workers aware of those trends.

Reviews of WRPS emergency drill program plan, interviews, and review of drill and exercise records since the transition to WRPS did not reveal any concerns. The FY 2011 Drill Program Plan, Tank Farm and 242-A Evaporator Drill Program Plan, issued October 2010, identifies training requirements, proficiency requirements, drill evaluation criteria for emergency response positions, and drill schedule for the tank farms and 242-A Evaporator. A separate FY 2011 Drill Program Plan for the 222-S Laboratory complex was also implemented in October 2010 and contains the same topical areas. Hanford site-wide emergency exercises are conducted by Mission Support Alliance, LLC, which is the mission support contractor, with WRPS participation.

Drill activities consist of tabletop drills, field drills, and drills in response to event scenarios and consequences identified in assessments, technical safety requirements, and building emergency plans. Lessons learned and performance strengths and weaknesses are documented, and weaknesses are entered and tracked through the corrective action system.

Employee involvement is evident through staffing of the emergency response positions. Staffing includes personnel from Radiological Control, Chemical Hygiene, Industrial Hygiene, and Operations. Other support positions are filled as needed. Drills are frequently conducted during off-shift and weekends to provide increased emergency response skills for facility personnel.

Company-level performance indicators track drill activity and drill scores. It was observed during the November 5, 2010, Executive Safety Review Board that the two indicators, along with other company-level indicators, were reviewed and praised by the Project Manager for the year-to-date exceptional performance.

WRPS utilizes the onsite medical provider, Advanced Med Hanford (AMH), for medical incidents. Previous VPP reviews have evaluated this process and have recognized its effectiveness. AMH uses the Employee Job Task Analysis (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 industrial hygienist, and the safety professional, 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 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 individual EJTAs may not be updated in a timely manner when workers change work assignments. Workers typically review EJTA with the medical provider during annual physicals, but they normally focus on their current job assignments. AMH intends that EJTA should cover all jobs the employee may perform in the coming year.

Interviews with employees identified that evaluations for employees to return to work with restrictions were conducted by Human Resources and management. Personnel working for the Base Operations organization stated that returning to work with any restrictions was "rare" and, typically, the worker needed to wait until the restrictions were lifted by AMH prior to being allowed to return to work. WRPS should consider reevaluating this process (or its perception) for accommodating workers with restrictions. For example, several of the workers interviewed who stated they were not allowed to return to work with restrictions, were seasoned, experienced tank farm workers with more than 20 years experience each. Such individuals could be utilized as mentors to the recently hired work planners who are currently undergoing operational training for tank farm operations. Linking the newly hired planners with seasoned tank farm operators who are limited to restricted duty could result in several positive outcomes. The seasoned operators would provide the planners with real tank farm operational experience, which the newly hired planners currently lack. The restricted workers could return to duty and, through their input into the new work control process, help establish ownership for the workers in that process, not just in the walkdowns but in the actual work package development. Additionally, by utilizing the restricted duty workers, WRPS will be recognizing the operators' knowledge of the tank farms and associated procedures and requirements, hopefully resulting in improved communications and improved worker input in the coming years from that experience.

Opportunity for Improvement: WRPS should consider utilizing experienced, restricted-duty tank farm workers to mentor newly hired work planners in the development of work packages during their restricted duty.

Conclusion

Overall, WRPS has an effective hazard prevention and control program. They have proactively pursued new technologies and methods that reduce potential worker exposures to hazardous tank vapors. WRPS has identified some weaknesses in the work planning and scheduling process, in PM, and is currenly in the process of addressing those weaknesses. WRPS managers should engage the workers in a collaborative process that effectively addresses those weaknesses in order to achieve DOE-VPP Star status.

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.

WRPS places great emphasis on health and safety training. It understands its responsibilities in these areas and knows how to effectively carry them out. It trains its managers and supervisors as well as its employees. Supervisors and managers receive special training in addition to that given to employees. A review of the selected training documentation and employee interviews indicated that training is being carried out in a thorough and systematic manner.

All new employees receive initial HGET, which provides general safety and health information, prior to receiving their site access badges. After HGET and the issuance of the badge, the new employee and the manager prepare an EJTA based on the employee's proposed duties. EJTA is a system maintained by AMH that documents essential functions to be performed, medical qualifications, exposure information, and the hazards to which the worker may be exposed. WRPS is also using this form to identify specific job training requirements. Once the manager and the employee complete the EJTA, it is sent to the WRPS training coordinator. The training coordinator makes arrangements for the employee to complete the identified training, and schedules the employee to take any required medical tests.

The job-specific training is described in the Integrated Training Electronic Matrix (ITEM). The employee's manager prepares a plan describing the various classes, computer-based training (CBT), and on-the-job training (OJT), which the employee will be required to complete. Facility-specific training is provided based on the employee's assigned location. Tank farm workers also receive Tank Farm Orientation (initial and annual refresher training). If the employee transfers from one facility to another, the employee is provided a brief training period prior to taking up the new assignment.

New employees also receive the New Employee Safety Orientation, which includes discussion of ISMS, VPP, ALARA, and Human Performance Improvement (HPI). It includes discussion of the Peer Safety Observation Program consisting of volunteers looking at-safe and at-risk behavior of coworkers, employee responsibility to exercise stop-work authority without fear of retribution, and injury reporting requirement. This orientation also briefs workers on the WRPS ergonomic process, which encourages all employees to have an ergonomic assessment of their workstations performed.

Hazardous Waste Operations and Emergency Response Radiological Worker II, and lockout/tagout programs are shared by all Hanford site contractors, and training is provided through the HAMMER Training Facility. In addition, WRPS provides a large number of CBT courses, which include HGET and HGET Refresher, 222-S Laboratory Facility Emergency Hazard Information Checklist (FEHIC), 242-A Evaporator Orientation and FEHIC, Tank Farm Orientation and FEHIC, Environmental Management Awareness, Tank Farm Criticality Safety, and Lead Hazard Communication.

WRPS also uses OJT for newly hired or reassigned employees. The employee is directly supervised by a qualified worker or OJT instructor/evaluator until he/she has completed the OJT

and received his/her qualification card. OJT instructors/evaluators must be subject matter experts in the activities they will train and evaluate. The OJT instructors also complete a formal, 6-hour OJT instructor training course and must requalify every 2 years. OJT instructors/ evaluators use OJT lesson plans and performance check lists to train and test the trainees. The employees are required to demonstrate proficiency on the equipment to the instructor before they are issued qualification cards. OJT must be taken every 2 years.

The training records of all employees are maintained in ITEM. When training is due, the employee and his/her supervisor are notified via e-mail from the training coordinator at 90, 60, and 30 days prior to the due date. If the required training is not completed, the employee cannot be assigned to the required task. Access to tank farm is controlled by the Access Control Entry System, which requires confirmation of the training by the entry station personnel who verify that the person entering has the required training. Additionally, supervisors and managers have access to Hanford Site Worker Eligibility Tool database, which lists all employees for specific job categories. The employees and managers were able to demonstrate to the Team that they are able to access the appropriate training records.

HGET, which is customized for each site contractor, includes a brief discussion of the five tenets of VPP. The VPP portion is also customized for each site contractor. The annual HGET refresher, customized for each site contractor, contains a complete description of each tenet. This approach helps new employees recognize the existence of VPP without overloading them with new information. This permits them to work in the VPP culture for the first year. Then when they take the annual refresher training, they receive more detailed information regarding each tenet. In September 2010, WRPS conducted a VPP Awareness Campaign. Employees were asked to complete a self-study course that contained a thorough discussion of VPP and ISMS. It described VPP and how it worked with ISMS and placed special emphasis on the roles of both the management and the employees in safety. It also described the five tenets of VPP in considerable detail, discussed the benefits of VPP, and, finally, how the employees could participate in the program by becoming a member of the VPP committee, participating in self-assessment interviews, and volunteering to help where needed. All employees who completed the self-study were given a plush blanket with a VPP logo as a token of appreciation for their interest in VPP.

Additional training for managers and supervisors consists of a 2-day course specifically designed for them. The first day emphasizes WRPS leadership expectations for managers and includes a Safe Work Environment (SWE) training module. The major elements of the SWE module are ISMS, VPP, and HPI. It also includes a discussion of the Employee Concern Program and how employees can raise safety concerns and conduct open communications with DOE facility representatives without fear of reprisals. The second day focuses on human resources and labor relations aspects of managers' responsibilities. It also includes a detailed discussion of the articles contained in the Collective Bargaining Agreement.

Further, all the managers are also required to take the following safety and health training classes:

- Safe and Drug Free Workplace Initiative;
- Nuclear Safety and Worker Safety and Health Rules;

- Tank Farm Contractor Environmental Management Overview;
- Handling Record Materials of all Employees;

- Originator of a Problem Evaluation Request;
- Tank Farm Contractor HGET; and
- Preventing Harassment.

Field Work Supervisors, Operations Engineers, and Work Management Leads are critical components of WRPS workforce and are given special training. The course material for them is the same, which is given to all employees, except that it is modified and expanded to incorporate supervision and management.

In addition to formal training, WRPS employees, supervisors, and managers also receive informal training through weekly Tailgate meetings, monthly Safety Meetings, and awareness campaigns. The topics discussed in these meetings are typical safety issues, such as lessons learned, changes in PPE, hazards, and prevention of injuries.

WRPS managers have a continuing interest in assessing the attitude of supervisors and employees regarding the safety culture. To gauge this attitude, every WRPS employee taking the annual HGET refresher is asked to respond with a "yes" or "no" to each of the following 12 questions:

1. Is your manager committed to safety?
2. Does your manager encourage a questioning attitude?
3. Are you comfortable in writing a PER for issues or concerns that you have identified?
4. Do you feel adequately trained to do your job?
5. Do you feel that Lessons Learned Program has had a positive effect in your job activities?
6. Do you trust your manager?
7. Does your manager adequately communicate safety expectations and commitment?
8. Do you feel free to raise issues to your manager without fear of retaliation?
9. Do you feel safe to raise issues using your avenues of choice without fear of retaliation?
10. For personal accountability issues, do you feel fair and unbiased actions are taken by your manager?
11. I have not been retaliated against in this year?
12. Do you feel that management is putting an appropriate amount of attention on the maintenance backlog such that it would not have a significant impact on people's relationship to safety?

The results of this survey are compiled and tracked monthly by the Employee Concerns Manager. Surveys from the past 12 months indicate positive responses from 95 percent or more of employees. In addition, WRPS uses an SWE survey to evaluate the status of the safety culture. From these results, WRPS concluded that supervisors, as well as the employees believed that the facility's safety culture was sound and that it played an important role in their work environment.

The Team attended a training class in Safety Significant Controls Qualification and Procurement. The class had 30 attendees of systems engineers, project engineers, and procurement engineers. The course covered the qualification and procurement of controls, which are significant for safety. The Team noted that the material was well presented and that there was an active and lively discussion among the attendees. The class ended with a quiz and the attendees were asked to complete a course evaluation sheet to provide a feedback on the course to the instructors. CBT is an important area of employee training. The Team reviewed a sample of CBT materials, including Radiological Controls Technician/Health Physics Technician Emergency Response

Training, Heat Stress Prevention and First Aid, OSHA's New Crane and Derrick Standard Briefing and Working Safely from Scaffolding, initial HGET, and refresher HGET. The material was appropriate for the type of work performed at the facility and useful in handling problems typically encountered there.

Another significant area of training is Chemical Hazard Awareness Training (CHAT), which has been provided to over 600 WRPS workers. CHAT covers the chemical hazards associated with the tank farm. This training is required for any worker going to the tank farm without an escort. Additionally, some offices, such as the Project Integration Office, require all their employees to complete CHAT.

The Team reviewed the safety and health training of the subcontractors at the Single-Shell Tank Retrieval Project and found that they follow the same safety and health training requirements as the WRPS employees. Subcontractor personnel also use 3 days (total of 24 hours) direct supervision over newly hired craft personnel in the tank farm. Newly hired subcontractor personnel are not allowed to work alone during this period.

WRPS relies heavily on the PER system to document and correct problems or issues encountered by its employees, but training on this system may not be effective. WRPS records indicate that 95 percent of all employees completed CBT on the PER system. Twenty Single-Shell Tank Retrieval Project workers, interviewed by the Team, did not recall any training on the system, despite training records indicating they had completed the training. Given the importance of the PER system to identify and report issues, WRPS should revise PER training materials and methods to ensure workers understand how to access the PER system and its purpose and ensure they are proficient in its use. Revisions might include an exercise to complete a PER as part of CBT and effective knowledge-level checks during CBT.

Opportunity for Improvement: WRPS needs to revise the PER training materials and methods to ensure workers understand how to access the PER system and its purpose and ensure they are proficient in its use.

The Team observed a High Efficiency Particulate Air Filter Task at Base Operations, which would also be used as an OJT mockup of a larger, more hazardous filter change out, currently in the planning stage. This task was also being used to train new employees. The Team observed several poor practices in conduct of operations and radiological control. Three-way communication was not effectively used, tools were passed across the radiological control boundary, and a radiological technician forgot to frisk his knees even though he had been seen kneeling in the radiological area. The Team pointed out these deficiencies to the WRPS safety lead who took appropriate corrective actions.

The Team also observed several good practices. For example, during training and mockups, workers are using radiation detector meters that can be remotely controlled by the instructor in the radiological control training. The student can hear what kind of sound is made by the meter when radiation is detected, giving him a fairly realistic idea. Another example was using bargaining unit employees to provide classroom training to new employees at HAMMER. A wellness specialist is on duty once a week to provide consultation to the employees in the exercise room with exercise equipment at the Base Operations. The exercise room is also available to Base Operations employees to use during lunch break and after work hours. The workers reported that the wellness specialist visits all the groups on a weekly basis and holds

brown-bag lunch sessions with them to provide information on various health-related topics, such as nutrition and diabetes, and weight management.

Conclusion

WRPS safety and health training and the associated training and qualification programs are well established and ensure that employees are appropriately trained to recognize the hazards to protect themselves and their coworkers. WRPS training programs equip managers, supervisors, and employees with the knowledge to understand the established health policies, rules, and procedures in order to promote safe work practices and minimize exposure to hazards. WRPS meets the requirements of the Safety and Health Training tenet of DOE-VPP.

VIII. CONCLUSIONS

WRPS managers and workers alike have demonstrated their commitment to maintaining a culture of safety excellence through the contract transition process. Further, they are committed to expanding that culture across the entire organization. Some project areas have been successful in achieving the partnership between managers and workers necessary to establish that culture. Other areas have not yet reached that level. Although not widespread, a significant number of workers remain distrustful of managers' motives and do not believe their managers have the workers' safety and health as a priority. Those beliefs are fueled by a long history with previous contractors at the site and past mistakes. Similarly, some managers believe workers are more interested in finding ways to delay work and incur overtime pay rather than find safe and efficient methods to achieve the mission. Again those beliefs are based on previous work history and practices. The increased accountability called for in the WRPS contract is necessitating many changes in overtime and leave practices that have not yet gained full acceptance by the workforce. Additionally, managers have not been widely successful in seeking worker input for how to make the changes required under the new contract. These attitudes by workers and managers alike are preventing the development of an effective safety culture in some parts of the organization.

Employee involvement and participation in the safety improvement initiatives has not yet reached the level expected of a Star site. There was a significant difference in the effectiveness of EAPCs with some functioning very well. The structure of the EAPCs is set up to foster greater employee involvement, but many employees, primarily among the bargaining unit, have stepped back from leadership and participation in those committees. Managers have assumed more of a leadership role on the committees rather than a champion role. EAPCs must become a forum for employees to discuss issues, propose solutions with management support, and generate ideas and promotional campaigns to encourage and expand worker involvement.

WRPS is successfully addressing longstanding difficulties with implementation of ISM. Although WRPS completed the ISM Phase I and Phase II verifications, it was clear that difficulties in work planning and hazard analysis remain. WRPS is working on solutions to improve both the effectiveness and efficiency of the work planning process, but changes in recent months have not had an opportunity to mature and gain acceptance by the workforce. WRPS needs to stabilize the work planning process, ensure workers are effectively trained on changes to the process, and give workers the opportunity to participate in the process with sufficient regularity to understand and accept the process, not just work around perceived problems.

Training for workers is extensive, and provides workers with the information necessary to understand and control the hazards to which they may be exposed. In some cases, primarily the PER system, training may not have been effective in ensuring workers clearly understand the purpose and process for submitting identified issues.

Throughout this report, the Team has identified opportunities for improvement. Those opportunities worded as "WRPS needs to…" indicate those areas the Team believes are critical for WRPS to achieve DOE-VPP Star status. The Team recognizes that WRPS 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 WRPS be moved from the transitional status and be admitted to DOE-VPP as a new applicant at the Merit level. As a Merit participant,

WRPS 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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George Wisner	Savannah River Nuclear Solutions/ Savannah River Site (SRS)	Base Operations/Tank Farm Projects
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