



Soil and Groundwater Remediation Project at the Hanford Site

**Report from the DOE
Voluntary Protection Program
Onsite Review
February 26 – March 2, 2007**



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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 (DOE-VPP) to encourage and recognize excellence in occupational safety and health protection. The DOE-VPP closely parallels the Occupational Safety and Health Administration (OSHA) Voluntary Protection Program (VPP), which was established by OSHA in 1982 and has demonstrated that cooperative action among government, industry, and labor can achieve excellence in worker health and safety.

DOE-VPP outlines areas where DOE contractors and subcontractors can comply with DOE Orders and OSHA standards while also “stretching for excellence.” DOE-VPP emphasizes systematic and creative approaches involving cooperative efforts of everyone in the contractor or subcontractor workforce at DOE sites, including contractor managers and workers.

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, research and development operations, and various subcontractors and support organizations.

DOE contractors are not required to apply for participation in the DOE-VPP. In keeping with OSHA’s VPP philosophy, participation is strictly voluntary. Additionally, participants may withdraw from the program at any time.

DOE-VPP consists of three programs, which are based on and similar to those in OSHA’s VPP. These programs are Star, Merit, and Demonstration. The Star program is the core of DOE-VPP, and its achievement indicates truly outstanding protectors of employee safety and health. The Merit program is a steppingstone for contractors and subcontractors that have good safety and health programs but need time and DOE guidance to achieve Star status. The Demonstration program is expected to be used rarely; it exists to allow DOE to recognize achievements in unusual situations about which DOE needs to learn more before determining approval requirements for the Star program.

By approving an applicant for participation in DOE-VPP, DOE recognizes that the applicant is meeting, at a minimum, the basic elements of ongoing, systematic protection of employees at the site. The symbols of this recognition are DOE-provided certificates of approval and the right to fly the DOE-VPP flags (e.g., DOE-VPP Star flag for sites with Star status). The participant may also choose to use the DOE-VPP logo on letterhead or on award items for employee incentive programs. Further, each approved site will have a designated DOE staff person to handle information and assistance requests from DOE contractors, and DOE will work cooperatively with the contractors to resolve health and safety problems.

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ABBREVIATIONS AND ACRONYMS

AJHA	Automated Job Hazard Analysis
AMH	Advanced Med Hanford
BLS	Bureau of Labor Statistics
DART	Days Away, Restricted, or Transferred
DOE	U.S. Department of Energy
DOE-VPP	U.S. Department of Energy Voluntary Protection Program
EJTA	Employee Job Task Analysis
ERSTI	Environmental Radiological Survey Task Instruction
EZAC	Employee Zero Accident Council
FH	Fluor Hanford Incorporated
HAMTC	Hanford Atomic Metal Trades Council
HASP	Health and Safety Plan
HGET	Hanford General Employee Training
HSS	Office of Health, Safety and Security
IH	Industrial Hygienist
ITEM	Integrated Training Electronic Matrix
JHA	Job Hazard Analysis
NAICS	North American Industry Classification System
OSH	Occupational Safety and Health
OSHA	U.S. Department of Labor's Occupational Safety and Health Administration
PHMC	Project Hanford Management Contract
PPE	Personal Protective Equipment
RAP	Risk Assessment Package
RCT	Radiological Control Technician
RWP	Radiological Work Permit
S&GRP	Soil and Groundwater Remediation Project
SIP	Safety Improvement Plan
TRC	Total Recordable Case
VPP	Voluntary Protection Program

EXECUTIVE SUMMARY

The Fluor Hanford Incorporated (FH) Soil and Groundwater Remediation Project (S&GRP) is responsible for characterization and remediation of chemical and radiological contamination of the soils and groundwater that are or could be migrating into the Columbia River or underlying aquifers. S&GRP applied to the U.S. Department of Energy Voluntary Protection Program (DOE-VPP) program in April 2006.

Acceptance into the DOE-VPP program requires an onsite review by the U.S. Department of Energy (DOE) Office of Health, Safety and Security (HSS) DOE-VPP team (Team). The Team conducted its review during February 26 – March 2, 2007 to determine whether S&GRP is performing at a level deserving DOE-VPP recognition. The purpose of this report is to document the results of the Team review and provide the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding the disposition of S&GRP's application efforts for DOE-VPP.

Based on interviews with over 100 members of the project team, extensive observation of work activities over a four-day period, inspection of worksites and facilities within the project scope, and reviews of records, the team determined that the S&GRP has established a strong safety culture and is performing well in all the tenets of DOE-VPP. The Team repeatedly heard from employees and managers that there has been significant improvement in all aspects of safety over the past four years. Additionally, the accident, injury, and illness rates for the project are well below their industry averages. Consequently, the Team recommends that the S&GRP be admitted into the DOE-VPP program with Star status.

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

Table 1. Opportunities for Improvement

Opportunity for Improvement	See Page
S&GRP should provide training to individuals responsible for maintaining and reviewing accident, injury, and illness reports and OSHA 300 logs.	5
S&GRP should establish a more consistent grading approach for inspection checklist scoring so that the reviews can be analyzed on an annual basis to identify developing trends.	11
S&GRP should improve the documentation of the technical basis for the monitoring practices being used to demonstrate that Radiation Work Permit entrance and exit points using the Environmental Radiological Survey Task Instruction and radiological monitoring practices are sufficiently conservative to maintain radiological exposure and risk of contamination spread as low as reasonably achievable.	16
S&GRP should review existing Health and Safety Plans and practices to ensure access requirements for visitors without site specific training (i.e., Hanford General Employee Training) are clear and adequate.	16
S&GRP should review controls required for chemical handling in remote facilities to ensure that the required number of operators are present, or identify alternative processes that would eliminate the need for chemical handling.	17
S&GRP should ensure that special controls identified in the Automated Job Hazard Analysis, Health and Safety Plan, or Radiological Work Permits (e.g., two person or radiation control technician coverage) are adequately integrated into a single work document (procedure or work instruction) to minimize risk of employees missing required controls and to promote efficient work completion.	17
S&GRP should consider further automating the training record recall system to send out notifications and periodic reminders automatically to the Training Coordinator when a course is coming due so it can be scheduled, and to the worker and his manager so they can ensure that the worker attends the course before his/her training qualifications expire.	23

I. INTRODUCTION

The U.S. Department of Energy Voluntary Protection Program (DOE-VPP) onsite review of the Soil & Groundwater Remediation Project (S&GRP) was conducted February 26 to March 2, 2007, at the Hanford Site in Richland, Washington. S&GRP is managed by Fluor Hanford Incorporated (FH), the prime contractor for the Management and Integration contract at the Hanford Site since 2002. The DOE Richland Operations Office provides direction to and oversight of FH.

The S&GRP manages activities related to cleaning up and protecting Hanford's groundwater and associated ecosystems including the riparian zone, where groundwater discharges into the Columbia River. S&GRP also manages facilities and performs remedial actions extending throughout the 100 and 200 Areas of the Hanford Reservation. S&GRP's primary tasks are to: remediate high-risk waste sites; shrink the contaminated area; reduce recharge; remediate groundwater; and monitor groundwater. The current work is directed primarily at characterization and containment, and involves a significant amount of well drilling. Additional efforts include pump and treat operations, maintenance, and waste management for investigation derived waste.

Managers and workers are present at the 100 and 200 Areas. The project has grown over the past four years. At the time of this onsite review, approximately 204 workers were employed at S&GRP. Staffing levels vary with workload.

Recognition in the DOE-VPP requires an onsite review by the Office of Health, Safety and Security (HSS) DOE-VPP team (Team) to determine whether the applicant is performing at a level deserving DOE-VPP recognition. The Team evaluated S&GRP's safety programs against the provisions of the DOE-VPP and consisted of safety professionals with VPP experience and expertise from DOE Headquarters and other DOE sites. During the site visit, the Team observed extensive work activities, evaluated relevant safety documents and procedures, and conducted interviews to assess the strength and effectiveness of S&GRP's health and safety programs.

The Team interviewed over 100 employees either formally or during observation of field activities. Most of the safety hazards associated with S&GRP work are common to general industry. These hazards include electrical, flammable and combustible materials, petroleum products, paints, welding, hoisting and rigging, noise greater than 85 decibels, confined spaces, thermal hazards, and compressed gases. While the predominant hazards are common industrial hazards, workers could encounter radiological and chemical contamination hazards that may be present at the Hanford Site. The radiological isotopes that may be encountered include uranium and plutonium, as well as a variety of fission and decay products, such as americium, cesium, strontium, and technetium.

II. INJURY INCIDENCE / LOST WORKDAYS CASE RATE

The Team conducted a review of the Occupational Safety and Health Administration (OSHA) 300 logs. The tables below summarize the OSHA reportable data for S&GRP employees. Occupational accident, injury, and illness statistics reported by FH include the subcontractor employees.

SOIL & GROUNDWATER REMEDIATION PROJECT INJURY INCIDENCE / LOST WORKDAYS CASE RATE

Injury Incidence / Lost Workdays Case Rate (FH S&GRP)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	Days Away, Restricted or Transferred (DART) Cases	DART Case Rate
2004	427,658	3	1.40	1	0.47
2005	476,234	2	0.84	0	0.00
2006	514,536	2	0.78	1	0.39
Three Years	1,418,428	7	0.99	2	0.28
Bureau of Labor Statistics (BLS-2005) average for NAICS Code # 5629			5.1		2.8

Injury Incidence / Lost Workdays Case Rate (Sub-Contractors)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	DART Cases	DART Case Rate
2004	30,392	1	6.58	0	0.00
2005	66,083	1	3.03	0	0.00
2006	44,839	1	4.46	0	0.00
Three Years	1,413,14	3	4.25	0	0.00
Bureau of Labor Statistics (BLS-2005) average for NAICS Code #5629			5.1		2.8

Total Recordable Case Incidence Rate including subcontractors: 1.28

Lost or Restricted Workday Case Incidence Rate including subcontractors: 0.26

Conclusion

S&GRP injury rates for FH are well below the averages for the comparable industry and meet the criteria for participation in the DOE-VPP program at the Star level. While the subcontractor numbers are higher, they are also below the comparable industry averages, and also meet the criteria.

III. MANAGEMENT LEADERSHIP

Management and 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 the DOE-VPP. Management systems for comprehensive planning must address health and safety requirements and initiatives. As with any other management system, authority and responsibility for employee health and safety must be integrated with the management system of the organization and must involve employees at all levels of the organization. Elements of that management system must include clearly communicated policies and goals, clear definition and appropriate assignment of responsibility and authority, adequate resources, and accountability for both managers and workers. Finally, managers must be visible, accessible, and credible to employees.

Interviews with the S&GRP managers, from the project Vice President down through the project organization, all demonstrated a clear commitment to the safety and health of every member of the project. Managers indicated, and the safety record confirms, that managers within the project view safety as an integral aspect of work. This attitude was evident throughout the workforce, contributing to a safety-conscious culture.

Project Hanford Management procedures define how work is accomplished, and include the integration of safety into all work. The Fluor Hanford Project Execution Plan describes the FH approach to safely accomplish the mission and goals established in the Project Hanford Management Contract (PHMC). A series of PHMC Procedures and Groundwater Remediation Project procedures define how the requirements and management processes are implemented. These processes and procedures adequately define the authorities and responsibilities for safety and health of the workforce. Observations of work and inspection of worksites clearly reflected the use of and conformance with processes and procedures.

The “*Fluor Hanford Safety Policy*,” HNF-5053, establishes a clearly stated policy on safe and healthful working conditions. This policy applies to all workers at the site, including FH employees and subcontractor personnel. This policy is communicated to all workers initially as part of the Hanford General Employee Training (HGET). It is available via the Hanford local area network, and the elements of the policy are posted on bulletin boards throughout the project. Further, the actions of the S&GRP management team communicate this policy to workers continuously; ensuring safety is a consideration in all actions. In addition, many employees and managers interviewed described how the safety policy and culture of the project was encouraging them to establish safer work practices at home.

FH has established specific goals for days away from work and recordable injury case rates. The S&GRP has a Safety Improvement Plan (SIP) that establishes actions to improve safety performance. Elements of that plan are posted throughout the project on Safety Bulletin Boards. The goals and actions established by that plan are more qualitative than quantitative. All managers and employees interviewed were, however, consistent in their understanding that the ultimate goal was “zero,” meaning that everyone was focused on trying to prevent all accidents, injuries, and illnesses.

Based on the information gathered during this review, sufficient safety resources are available to perform safety and health functions. There is a dedicated staff with expertise in industrial hygiene, industrial safety, and radiological controls to provide the necessary support to safely accomplish field work. Although there are adequate numbers of radiological control technicians (RCTs), additional health physicists could assist in improvements to the Radiological Controls technical bases (see Section VI, Hazard Prevention and Control).

All personnel contacted during the review clearly understood they had the authority and responsibility to shut down any operations, processes, or work if unsafe conditions existed. The Team observed one case where workers identified that an additional control from the Health and Safety Plan (HASP) at ZP-1 Pump and Treat had not been incorporated into their work package. The HASP required an RCT to be present whenever the system was opened, because of the risk of low levels of contamination. Workers identified the control in the HASP, and stopped work while they waited for an RCT to support the work (see Section VI, Hazard Prevention and Control, for discussion of the control implementation).

The S&GRP is organized to provide clear lines of authority, including safety and health. The project contains groups that are responsible for identifying required investigations and sampling strategies, technology assessment, and engineering. These groups provide support to the field operations group to integrate available information and ensure that field work safely achieves the desired goals. For example, the Environmental Information Systems group maintains databases that contain all the sampling and characterization data that has been collected. These databases are used to predict the hazards and contaminants that might be encountered during drilling activities. Such information is then used by the other groups that develop sampling plans to determine sampling frequencies and location, and by RCTs to determine radiological controls. Another group is working to identify alternative characterization and remediation technologies that would reduce risk to workers and the environment, as well as accelerate the cleanup efforts.

There is no evidence that unsafe conditions or practices in the contractor's operations at the site are occurring because of inadequate resources. The S&GRP has been growing, both in personnel and budget. Most of that growth is being fueled by the need to better integrate the investigation and remediation efforts. Managers who were interviewed did not indicate any shortcomings in the resources needed to safely accomplish the project mission. Safety and health staff appeared to be adequate in numbers, training, and experience.

During review of the OSHA 300 logs, the Team identified that the person assigned to review and maintain records for accidents or injuries had not received any formal training preparing him for that position. He has only been assigned that responsibility for approximately two months, and does not have a good understanding of the requirements, standards, and regulatory interpretations associated with illness and injury statistics. A review of the last three years' data identified three out of 60 reported cases that were improperly classified as "not work-related." The first case involved a worker noticing an insect bite on his arm at the end of shift. The case was recorded as not work-related since it could not be determined if he received the bite at home or at work during the shift. OSHA interpretations are that if there is a likelihood the injury occurred at work, it must be classified as work-related. The second case involved a worker becoming ill when exposed to exhaust fumes and smelling melting plastic when a plastic sheet became

entangled in the exhaust pipe of a running truck. The case was recorded as not work-related since the employee may have been sick when he came to work. The record from the medical visit states the employee may have been sick when he came to work, but that could not be confirmed, and the exhaust fumes and smell made a significant contribution to his condition. Again, OSHA interpretations state that this should be recorded as work-related. The third case occurred when an employee turned his chair to work at a computer station and experienced a “pop” in his knee. The reason for being classified as not work-related was given as the injury occurred while participating in an approved exercise activity. The employee had been sitting on the edge of a table swinging his legs (an approved stretching and warm-up activity). The injury did not occur until the employee was seated back at his work station and turned to work on the computer. Again, per OSHA interpretations, this should have been recorded as work-related. Further, since the knee was immobilized and resulted in a prescription for pain medication and restricted work activity, this injury should have been included in the 2006 TRC rate. When these errors were communicated to FH, the FH Vice President tasked the S&GRP Vice President with determining why these errors were not self-identified by FH, and to determine if any changes were required in the FH review of occupational injury and illness reporting.

Opportunity for Improvement: S&GRP should provide training to individuals responsible for maintaining and reviewing accident, injury, and illness reports and OSHA 300 logs.

FH has defined processes to reward good performance and identify and correct poor performance. HNF-PRO-033, “*Employee Discipline*,” describes the process to be implemented by FH and its PHMC Team managers when employees fail to act in ways conducive to a safe and productive work environment or violate the Standards of Conduct Policy. This procedure applies to all employees of FH and its PHMC Team employees. It defines the requirements and establishes the process to be implemented to ensure that the company’s Standards of Conduct Policy is effectively applied in each employee’s daily work in order to maintain a safe and productive work environment. HNF-PRO-050, “*Managing Employee Performance*,” provides general guidelines for FH and PHMC Team employees performing PHMC scope of work, for managing employee performance and development. It addresses general guidelines for defining, measuring, and continually improving employee performance, including safety expectations/standards. Issues related to bargaining-unit employee performance are addressed directly by supervisors, safety professionals, and peers.

The S&GRP Employee Zero Accident Council (EZAC) has developed an employee recognition system that provides a variety of small recognition awards. Awards include “On the Spot” awards valued at \$25 for observed noteworthy safety practices, an Employee of the Month recognition valued at \$50, and random drawings valued at \$50/employee for four employees each month when there are no OSHA recordable injuries/illnesses. FH employees and subcontractor employees working on the project are eligible for these awards.

Managers in the S&GRP are clearly visible and in frequent communication with workers. Within the Field Operations Group, there is a weekly meeting, run by the Field Operations Manager, at which employees are encouraged to voice concerns. These meetings were initiated

by the Field Operations manager in response to workers' complaints that managers did not listen to workers or address valid concerns. The result of these meetings, along with other initiatives to ensure managers are responsive to employee concerns, has been noteworthy. In the course of a few years, the culture within the S&GRP has been significantly enhanced. However, there is a possibility that workers have become so confident in their ability to get problems addressed by simply informing their managers and supervisors, that they no longer use the systems designed to capture and track lessons learned from these safety issues. S&GRP managers are aware of this possibility and are seeking other means of capturing these improvements.

All persons working at the Hanford Site for more than a certain number of days are required to complete the HGET and General Employee Radiological Training. These requirements are implemented through the employee badging process, ensuring that only persons who have met the requirements gain access to the site. Within the S&GRP, each worksite maintains a visitor log and a HASP briefing log. Every person who will be accessing the controlled area around the worksite is required to review the HASP and document that review by signing the log.

Subcontractors on the S&GRP are held to the same high standards as FH employees with regard to safety and health performance. Safety and health performance by the subcontractor is clearly identified in the Request for Proposal as one of the criteria for selection and award of contract. Once selected, FH assists its subcontractors in improving safety and health performance. For example, FH noted one subcontractor as having a poor performance record. Rather than terminating the subcontractor, FH teamed with the subcontractor managers to identify the causes of the poor performance and establish corrective actions to improve performance. Over the course of the next few months, the subcontractor's performance improved and the subcontractor managers became strong supporters of the new safety approach. They recognized safety not only as a requirement, but as an effective and efficient business practice that contributed to better bottom-line performance.

All subcontractor work is overseen and supervised by FH Buyer Technical Representatives. Buyer Technical Representatives are present at the drilling sites and are responsible for monitoring the subcontractor activities from both a technical performance as well as a safety standpoint. Subcontractors are also invited to attend project safety meetings, including the Monday Morning project meeting. Initially perceived as a cost by FH managers outside the project, this practice is now seen as an investment, with significant returns through reduced costs for rework, and cost avoidance by reducing and eliminating safety problems before accidents, injuries, and illnesses occur.

HNF-RD-7652, "*Safety and Health Inspections*," establishes the minimum requirements for: conducting and documenting general hazard inspections and baseline hazard assessments; assessing safety and health impacts associated with proposed facility changes to ensure that the potential for any new hazards being introduced into the workplace as a result of change is adequately identified and addressed; conducting and documenting general observations of safe behaviors in the workplace; and providing on-the-spot coaching when an unsafe act/behavior is observed. In addition, managers and employees are encouraged to identify and correct safety performance. S&GRP has performed at least two annual assessments that included surveying the workforce regarding safety performance. Based on those surveys, FH decided to delay

application to the DOE-VPP program until both performance and perceptions had improved. The most recent assessment indicated significant improvements and drove the decision to make the DOE-VPP application.

Conclusion

Managers within the S&GRP have teamed effectively with the workforce to implement a strong safety and health ethic. There is widespread acceptance and belief that safety is a core value that must be incorporated into every task. Further, because of the dependence on subcontractors for much of the hazardous work, the subcontractors are treated as part of the team. The improvements in workers' and managers' attitudes and communication over the past several years are notable.

IV. EMPLOYEE INVOLVEMENT

Employees at all levels must be involved in the structure and operation of the safety and health program and in decisions that affect employee health and safety. Employee participation is in addition to the individual right to notify appropriate managers of hazardous conditions and practices.

S&GRP employees are actively engaged in the safety and health program. A review of program documents and the information collected from interviews with employees indicated that management has fully empowered employees to participate in the safety and health program. Employees were familiar with the principles of DOE-VPP and often indicated their sense of ownership of their safety as well as their co-workers. Several employees indicated that looking out for their co-workers' safety would be no different than looking out for the safety of a family member.

The employees who were interviewed by the Team have worked for S&GRP for periods ranging from one month to more than four years. Those with more than 4 years with S&GRP often remarked how the safety and health program has improved tremendously under the present management team. Employees are involved in a variety of safety-related programs that appear to be adequate and appropriate for the S&GRP organization. Examples include the EZAC, Automated Job Hazard Analysis (AJHA) reviews, and regular project safety meetings. The SIP describes specific safety improvement goals and personal commitments that employees have developed and agreed upon through the EZAC. The SIP improvements and commitments incorporate the five basic DOE-VPP tenets.

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

Employees were candid and exhibited a willingness to speak freely with Team members during the interview process. All interviewed employees indicated that they understood their rights and responsibilities and were very knowledgeable about their safety and health responsibilities.

Employees strongly expressed their readiness to stop work if they felt conditions were unsafe. They also indicated they would intervene if they observed a potential hazard that would affect their co-workers. Although only a few employees had exercised their right to stop work, they also indicated that they did so without fear of reprisals from supervisors or managers. Employee concerns were usually resolved in a timely manner (by the end of a shift or no later than the next day). Safety logbooks and Issue Concern forms are available to employees to bring concerns to management and the EZAC. Employees can submit concerns anonymously or through their supervisors or through other employees. Employees can also bring safety and health concerns and issues to their immediate supervisors' and co-workers' attention during weekly safety meetings and daily plan of the day meetings. Employees were comfortable with the concern resolution and feedback mechanisms available.

Based on worker interviews and a review of documentation, employees were motivated about the company's position on building a safe work environment by keeping them engaged in the company's safety and health process. Interviewed workers indicated that management encourages them to participate in safety inspections, attend the annual Hanford Safety Expo, and serve on a safety and health committee or subcommittee.

Approximately 33 employees participate in the S&GRP EZAC and its 8 subcommittees. The EZAC and subcommittees are made up of managers, employees, and bargaining unit representatives – Hanford Atomic Metal Trades Council (HAMTC). EZAC's annually elected positions include two co-chairs (one bargaining unit and one non-bargaining unit member) and the EZAC secretary. The EZAC subcommittee groups are: Communications Team; Vehicle Safety; Safety Improvement Plan; Safety Recognition Program; Goodwill Committee; VPP Leadership Team; and VPP Steering Committee. Most subcommittees include a chair and at least five members. At least one representative from each workgroup is represented on the EZAC, and all employees are invited to attend EZAC meetings (with management's approval) and participate in council activities.

EZAC meetings are held monthly and provide members with an opportunity to review new and ongoing safety ideas and issues and to recognize safety achievements, safety performance, and safety nominations. Members also discuss lessons learned from close calls or accidents, status reports of subcommittee activities, the promotion of special safety and health campaigns, inspections, and program reviews. Meeting minutes are documented and shared with the workforce through the S&GRP website, emails, and postings on employee information bulletin boards. On a daily basis, workers are involved in their respective plan of the day meetings in which supervisors and workers have the opportunity to discuss any safety and health concerns that affect the immediate work at hand and discuss lessons learned from other organizations throughout the site.

Employees credit the improved employee morale to management's open door policy, which has allowed them to report concerns through informal and formal processes. Improvements in management/worker communication have helped facilitate improved worker/worker communications throughout the project.

Several programs are in place under the EZAC Employee Safety Recognition Program that promote safe work behaviors and contribute to employee morale. For example, approximately 125-130 gift cards were distributed to employees as recognition for safe work and for identifying and resolving safety concerns/issues.

Conclusion

Employee ownership is strongly rooted across the S&GRP organization. Management and employees have worked together to develop open lines of communication to identify and promote safety and health responsibilities, goals and expectations, and the identification of potentially hazardous conditions.

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 identify and analyze all hazards encountered during the course of work. 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 a system to ensure those new or newly recognized hazards are properly addressed.

Employees participate in pre-job planning through the AJHA process. Employees also are involved in developing and/or validating the operating procedures for new and/or used equipment and processes. The extent of employee involvement and the methods of analysis used are based on a graded approach based on complexity of design and scope. One of the S&GRP VPP Improvement Initiatives was to establish a formal process of employee involvement in hazard analysis and pre-job planning, including work-package development. The Team review included observing the formal AJHA process for the ZP-1 Replacement Well # 4 Assembly and observing a formal walkdown by S&GRP personnel of a work package for the replacement of a unit heater at the HR-3 Process Building. Interviews with employees and observations throughout this assessment verified that the pre-use/pre-startup analysis processes are formal and well established in S&GRP.

S&GRP work packages and/or training typically require pre-use and pre-start testing on equipment prior to start of work each day. For example, the drill crews are required to inspect the cables, rigging, and all motor fluids prior to starting work. Field observations confirmed this practice was routinely performed. However, in one case, an employee performed the pre-start check but did not note that a compressor motor was overdue for annual inspection and servicing.

The S&GRP self-inspection program is broad ranging and involves diversified teams including management, supervision, safety professionals, and all levels and functional areas of employees. The S&GRP worksite analysis and hazard recognition activities and programs are well defined and administered through the SIP. The SIP defines the elements, specific objectives, and associated performance measures related to continuous improvement, safety awareness, and team participation in safety-related activities. Specific elements defined and administered through the SIP include: S&GRP Employee Safety Recognition Program, Safety Improvement Plan Action Items, Safety Ideas/Issues Program, Safety Activities-Value & Participation Program, Health and Safety Self-Inspections, Hazard Communications, Vehicle Safety Activities, and Injury Investigation and Case Management.

Formally scheduled inspections are conducted on a weekly and monthly basis. The safety group staff members are required to perform ten safety inspections per week, utilizing the group's standardized safety inspection checklist. The checklist covers general safety issues and each issue is assigned a grade which is used to calculate the total score. Managers in the groundwater group are tasked with performing one safety review per month, and the Field Manager often participates in these inspections. Task-specific safety checklists are also used by the safety group and managers for such areas as Pump and Treat, Drilling, Office, and General Inspections. Any "hot" issues are written into the checklist comment section and then tracked in the safety

group's tracking system. Responsible individuals are assigned to each task, and the responsible persons are given monthly lists of their open items. The checklist covers general safety issues and each issue is assigned a grade which is used to calculate the total score. The tracking log is well maintained and the backlogs are not excessive.

Groundwater staff can bring safety issues to the safety group personnel or advance an issue through their management. Fire inspections are conducted by qualified Hanford Fire Department personnel in accordance with DOE requirements to meet National Fire Protection Association requirements. All S&GRP facilities have operational surveillance programs. Surveillances are documented, and required actions are tracked to completion through facility tracking systems.

Interviews and reviews of inspection checklists and instructions showed that grading criteria may vary from one inspector to the next. This potential inconsistency reduces the ability to compare results over time.

Opportunity for Improvement: S&GRP should establish a more consistent grading approach for inspection checklist scoring so that the reviews can be analyzed on an annual basis to identify developing trends.

Trend analysis for injury/illness case rates, job classifications of injured employees, and types of injury/illness are tracked at both the project and facility levels. This data is provided to management and discussed at the S&GRP EZAC monthly meetings, facility staff and EZAC meetings, and posted in facilities. Each S&GRP subproject uses facility-specific reports on performance indicators to monitor the processes used to reduce hazards. Copies of sitewide trending documents are shared at the EZAC monthly meeting, and the facilities use this information to develop safety meeting topics, to prepare annual SIPs, and to focus on safety training. Safety and health staff analyze and trend event reports, the causes of motor-vehicle accidents, and violation data to communicate areas of both success and needs for improvement to employees.

FH performs injury, illness, and event trending and provides results to the S&GRP safety group. S&GRP reviews the data received from FH to identify any adverse trends or conditions and incorporates it into their safety inspections if trending indicated it is necessary.

Hazard analysis is performed by several processes in the S&GRP project. A work package with medium to high risks will include a Job Hazard Analysis (JHA), a HASP for addressing industrial hygiene issues, and a Radiation Risk Assessment Package (RAP) to address radiological issues. The JHA lists the potential environmental, industrial, and safety hazards associated with the specific activity. All JHAs that were reviewed were comprehensive and adequately covered the hazards. The HASP addresses the specific industrial hygiene hazards associated with the specific task to be performed and describes the required personal protective equipment (PPE) for those hazards. The HASPs that were reviewed were comprehensive and adequately addressed the hazards associated with the work. The RAP is a collection of all associated radiological work planning documents for a particular task. The RAP is used to determine whether the task to be performed represents a high, medium, or low radiological

hazard to the workers. If the RAP indicates the task is a high or medium radiological risk, a Radiological Work Permit (RWP) will be developed with appropriate PPE specified. In some circumstances such as drilling operations, where the majority of the work will have no radiation but there is the potential for significant radiation at some point, the RWP will be developed and included in the work package; however, the RWP will not be triggered until the Environmental Radiological Survey Task Instruction (ERSTI) levels are reached. The ERSTI is a work planning document that provides specific direction to the RCTs regarding survey requirements for soil. The ERSTI radiological levels are much lower than the RWPs' established levels for PPE requirements. By using the lower ERSTI radiological levels to determine when the RWP PPE will be required, S&GRP can limit the time workers are using PPE when it is not necessary. The technical basis for the ERSTI triggering the RWP requirements is discussed further in Section VI, Hazard Prevention and Control.

Employee interviews confirmed that they are fully aware of how to report hazards. While there are formal mechanisms for reporting hazards, most employees feel comfortable reporting hazards to their supervisors and expect that hazards will be corrected promptly. The Safety Logbook is available to all workers, including subcontractors, for identification and tracking/trending of hazards to completion. Other avenues available to report hazards include the HAMTC Safety Representative, safety and health staff personnel, the FH Employee Concerns Organization, or the DOE Employee Concerns Office. All employees understand they have the right, without recrimination, to request "Stop Work" if a serious safety issue or imminent danger is noted. Employees have several methods to report or identify safety concerns. Those methods include but are not limited to reporting issues directly to their manager, union safety representative, members of the safety group staff, or DOE. Field observation demonstrated evidence of good communication between workers and management during the morning tailgate meeting, plan-of-the-day meetings, and work activities in the field.

All OSHA recordable, first-aid cases, property/vehicle damage, and near misses are investigated. The S&GRP safety group is responsible for performing accident investigations within the S&GRP. One of the SIP goals is to insure that workers participate in accident-investigation teams as appropriate, and employees who have attended one of the S&GRP-sponsored Accident Investigation Workshops in 2004 can participate in investigations. Lessons learned are shared via electronic mail, staff and safety meetings, required reading, and formal training.

The S&GRP has conducted two accident investigations in the past two years. While both incidents were relatively minor, they were analyzed and corrective actions were recommended. Event investigations are performed for any reportable event or injury, and reports include a description of the event, employee statements, and any resulting corrective actions.

S&GRP uses multiple methods to determine safety and health hazards. Comprehensive initial startup facility assessments and subsequent annual facility assessments are used to document safety and health hazards associated with occupancy and work activities. Health and safety plans and training are developed using the results of the assessments, and personal monitoring needs are defined to validate the effectiveness of protection strategies and controls.

The S&GRP uses the employee job task analysis (EJTA) process that is supported by the site medical provider, Advanced Med Hanford (AMH), for a risk-based approach to medical monitoring. This process identifies work locations and job classifications, determines medical qualifications, describes the types of physical activities required, presents exposure information, and includes the overall risks associated with the assigned work scope. AMH uses the EJTA data to establish the protocol for medical monitoring. Recognizing the need for accuracy, the S&GRP Safety Manager has established an annual review of EJTA's rather than the three-year frequency required by FH. Review of the S&GRP EJTA records, and interviews of S&GRP safety and industrial hygiene personnel assigned this task, verified they are actively working to maintain accuracy and currency of S&GRP employee EJTA data.

Conclusion

S&GRP has good worksite analysis processes and procedures in place in such areas as periodic safety inspections by safety professionals, employee reporting of safety concerns, and trending of injury and hazard related data for analysis and generating corrective actions and lessons learned. The work environment is monitored for environmental quality based on the analyzed hazards. The workers are involved in hazard identification on a daily basis before the start of work. JHAs, HASPs, and RWPs are used to identify the hazards and establish the controls required to perform the work safely.

VI. HAZARD PREVENTION AND CONTROL

Once hazards have been identified and analyzed, they must be eliminated (substitution or changing work methods) or addressed by the implementation of effective controls (engineered controls, administrative controls, and/or PPE). Equipment maintenance, PPE, 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, and followed by everyone in the workplace to prevent mishaps or control their frequency and/or severity.

Because of the nature of work being performed, most of the hazards are controlled by use of industrial PPE (typically, work gloves, hard hats, substantial footwear, ear plugs and muffs, safety glasses). Occupational safety and health PPE is required in job-specific HASPs. Radiological controls are identified by the RWP. The job-specific requirements for PPE are based on documented hazard analysis. HASPs and RWPs are reviewed and approved by appropriate safety and health professionals as well as line management. S&GRP demonstrated that proper use of PPE is taken seriously by employees and subcontractors.

S&GRP personnel have been able to use engineered controls in some cases to minimize worker exposure, prevent environmental spread of contamination, and reduce the need for additional PPE. For example, S&GRP has developed a ventilation system to be used during drilling operations that have been characterized as potentially medium to high radiation tasks. When the potential for high contamination levels in the soil exists, S&GRP installs the ventilation system into an enclosure used to support the ventilation and provide protection from the elements. The engineering group in S&GRP has refined the design several times based on lessons learned and in some cases, based on employee recommendations. Once the ductwork is installed, instrument technicians establish and balance the systems flow rates and verify that high efficiency particulate air filtration is functioning in accordance with the flow and balancing procedure. If no contamination is encountered, the system is not activated. However, once contamination is encountered, the operators activate the system and maintain it in accordance with the operating procedure prepared specifically for the system. The system was not in use during this review, but interviews with workers demonstrated great satisfaction with the system and enclosure. The workers also appreciated management's responsiveness to their recommended changes and improvements to the system. Some examples of employee changes include: changing the configuration of the truck in the enclosure to facilitate the changing of drill bits and weights, the addition of "skylights" to improve visibility, and eliminating the numerous damper controls which required the workers to enter the "hot zone" to make adjustments.

Visits to drilling and pump-and-treat sites revealed that employees working at those sites are very familiar with the expectations for the use of PPE. Borehole drilling sites use "double" hearing protection when drill rigs are in operation. All workers, including visitors, at drill sites and pump-and-treat sites are required to wear substantial footwear, eye protection, and hard hats to enter the sites. Appropriate additional PPE is required by HASP or other documentation when employees handle hazardous materials (e.g., sulfuric acid at the pump-and-treat worksites) or are near heavy material handling operations (e.g., within the control zone of a drill site). Electricians performing lockout/tagout wore well-maintained PPE for shock and flash protection (gloves,

clothing, and face-shield). In one case, an electrician was observed checking the date of voltage-rated gloves before a job; this electrician discovered that the gloves were out of date, appropriately removed them from service, and obtained proper gloves.

RWPs are used to control radiological hazards with the potential to impact worker safety and health. ERSTI documents are used to document radiological risk and controls for environmental radiological hazards that do not have the potential to require worker safety radiological controls. Entry into or removal of RWP controls for borehole drilling or logging operations may be triggered by the ERSTI. When an RWP is invoked, continuous RCT coverage and Radiological Worker 2 controls are in place as specified by the RWP.

S&GRP Radiological Control has developed an innovative approach to deal with a radiological issue unique to the project. Specifically, they have developed an innovative program to address the special radiological issues associated with radiologically contaminated volumetric samples associated with the soil matrix. Drilling and other work in boreholes can result in the operation moving into and out of strata of radiological concern, depending on the depth of the point of operation or other aspects of the work (e.g., bringing samples or drill cuttings to the surface). Conventional radiological control survey practices using field instruments can only detect radioactive materials down to the nano-curie/gram level using surface/area measurement techniques; such practices do not provide sufficient sensitivity to trigger entry into RWP controls before potentially hazardous worker exposure takes place. Measurement of pico-curie/gram radioactive materials in volumetric matrices is necessary to allow efficient operations and trigger appropriate radiological control as drilling operations move from “clean” to contaminated and back to “clean” strata. S&GRP uses ERSTIs to implement use of radiation detection instrumentation that is not typically used in the field (such as sodium iodide and germanium-lithium detectors) to obtain real-time measurement of gross gamma activity in volumetric samples. Trigger levels of radioactivity in volumetric samples are established in the ERSTI (based on historical experience) to allow upgrading and/or downgrading of radiological controls for worker safety and health as operations proceed.

In one instance (A-4 borehole) the radiological risk assessment package predicted that activity would be found in the 30 to 40 foot level. However, unexpectedly, significant contamination was not found until a depth of 63 feet. Given the informal rule-of-thumb that radiological controls can be removed “20 feet below the expected level of activity,” radiological controls might have been removed at approximately 60 feet, which would have resulted in the potential for uncontrolled worker exposure. Fortunately, because of the experience and conservatism of the radiological control staff, the RWP controls were kept in place to 132 feet, and no exposure resulted. This event demonstrates there is a need to ensure that good analysis is consistently performed and conservative approaches are institutionalized to ensure that radiological controls are in place when needed.

The technical basis and approach for using the ERSTI and non-conventional measurement methods to trigger entry into and exit from RWP controls is not as well documented as it could be. Such a technical basis should document conservative assumptions, methodology, limits, and the overall process for doing risk analysis and implementation of the ERSTI to support appropriate use of RWP controls.

Opportunity for Improvement: S&GRP should improve the documentation of the technical basis for the monitoring practices being used to demonstrate that RWP entrance and exit points using the ERSTI and radiological monitoring practices are sufficiently conservative to maintain radiological exposure and risk of contamination spread as low as reasonably achievable.

In another situation, implementation of a recent policy change related to control of Radiologically Controlled Vehicles resulted in inappropriate posting of Radiologically Controlled Vehicles for several weeks. An RCT-initiated Radiological Problem Report highlighted the concern and was carefully evaluated by a team of staff, management, and subject matter experts, and an appropriate path forward was identified. This process highlighted the importance of employee involvement in dealing with challenging compliance issues.

HASPs are used to communicate/prevent hazards and specify appropriate controls for routine work. Maintenance work is controlled under well prepared and validated work planning packages. AJHA documents, developed using an electronic tool and team meetings, are prepared for complex or higher-than-normal-risk work activities. Standing AJHAs are available for significant work activities that are prepared infrequently.

S&GRP personnel responsible for access to worksites (e.g., Buyer Technical Representatives, Nuclear/Chemical Operators, maintenance/operations supervisors) were very diligent in communicating the need for HASP reading, verifying that requirements were understood, and enforcing visitor access requirements (training, access logging of entry and exit) for locations where it was required (e.g., drill sites and pump-and-treat facilities). There were several instances where HASPs for pump-and-treat did not state a clear requirement regarding the need for escorted visitors to receive HGET. Shortly after the issue was identified, S&GRP proposed a minor revision to the HASPs to clarify that visitors without HGET may be escorted by a qualified worker.

Opportunity for Improvement: S&GRP should review existing HASPs and practices to ensure access requirements for visitors without site specific training (HGET) are clear and adequate.

In addition to use of PPE or use of engineering controls, there was evidence that hazards are being eliminated during design of new facility/equipment design. For example, 120VAC power supplies were eliminated from panels with 24VDC control circuitry that needs to be accessed. In the past, these panels have contained both 24V and 120V circuitry, requiring additional controls when performing work on 24V control circuits. Redesigning the panels to remove the 120V circuitry reduces the need for electrical PPE during maintenance work and makes a safer work environment.

Higher-than-normal-risk activities, such as chemical transfer, working at height, and energized electrical work, require two qualified persons to be present. This requirement is clearly stated in

procedures. During inspection of remote facilities and in interviews, operators expressed that meeting the two-person requirement during chemical handling was sometimes difficult.

Opportunity for Improvement: S&GRP should review controls required for chemical handling in remote facilities to ensure that the required number of operators are present, or identify alternative processes or methods that would eliminate the need for chemical handling.

A job involving use of a calibration procedure included in a ZP-1 work package did not include the required step for RCT coverage when breaking into potentially contaminated line. The requirement was included in the HASP, and one of the employees assigned to the job recognized that RCT coverage would be required. The job was delayed until the RCT arrived.

Opportunity for Improvement: S&GRP should ensure that special controls identified in the AJHA, HASP, or RWPs (e.g. two person or RCT coverage) are adequately integrated into a single work document (procedure or work instruction) to minimize risk of employees missing required controls, and promote efficient work completion.

AMH provides all medical services for S&GRP (and other site contractors), including acting as the medical director, providing medical surveillance, maintaining medical records, providing medical evaluation, and performing other medical-related activities. The EJTA defines medical surveillance requirements for each staff member and subcontractor. The Industrial Hygienist implements the EJTA program and performs an annual assessment of the status of EJTA's as part of the SIP. Job activities requiring medical surveillance are scheduled for evaluation by AMH, which uses EJTA information to guide medical surveillance and monitoring. Use of EJTA is a key way that S&GRP coordinates with AMH medical monitoring and surveillance.

Workers with potential exposure or a minor injury/illness are evaluated by AMH. Emergency medical response service is provided by the Hanford Fire Department, and serious cases can be transported directly to the local hospital. Field workers are provided with first aid, Cardio-Pulmonary Resuscitation, and Automated External Defibrillator training when it is required by their job. First-aid kits are provided in facilities and at key worksites/vehicles.

Site emergency preparedness activities are the primary driver for alarm testing and emergency drills. Sitewide alarm tests are conducted regularly, and each site area typically has two drills each year. Drills may include evacuation, take-cover, or personal injury scenarios. S&GRP employees and subcontractors participate in drills for the area they are in, unless specifically exempted. A total of four drills were conducted last year by S&GRP (including two 200E Area drills administered by site components outside of S&GRP). Some S&GRP employees reported that they did not recall participating in emergency drills in the recent past.

Emergency drills present a special challenge to S&GRP because most of the employees are dispersed and mobile. Current approaches to emergency preparedness drills often do not address situations likely to be encountered by S&GRP workers. Creative approaches to exercising the

S&GRP emergency preparedness process (in addition to the traditional Site and facility approach) could improve employee awareness and readiness to respond to credible, serious emergency scenarios related to S&GRP activities.

S&GRP employees are knowledgeable of appropriate response to emergencies as a result of annual HGET, postings in all major facilities, and documentation such as HASPs.

Plan of the day meetings (for all field workers) focus on emergency response expectations and preparedness for potential upset conditions associated with the day's activities. Emergency preparedness for potential chemical exposure at pump-and-treat sites is good; portable eye-wash stations and drench/safety-shower stations are readily available and well maintained near the site of potential exposure.

S&GRP field activities present special emergency response challenges because of the widely dispersed workforce and the mobility of most of the workers. Some workers in particular work alone for long periods of time. Cell phones are used by virtually all S&GRP staff to communicate about routine work issues and as a flexible emergency communications system. There are areas where cell phone coverage is known not to be good, but experience has shown that cell phones typically provide adequate communications. An analysis of the adequacy of cell phone coverage was conducted when the site switched from the use of portable radios to cell phones as the primary communications system for operations. Hard-wire telephone lines are provided at permanent facilities (including pump-and-treat stations). Employees are prohibited from working alone when doing above-normal-risk activities, such as chemical transfer and energized electrical work. Supervisors (and Buyer Technical Representatives for subcontractor operations) stay in frequent contact with workers/work teams.

When a site emergency alarm is received by S&GRP management, communications (typically by cell phone) are propagated down the management chain to all workers. The Hanford Site is in the process of implementing an automated emergency notification system that will dial specified cell phones to provide alarm notification to the users. It is anticipated that most S&GRP field workers will be covered by this system.

The Occupational Safety and Health (OSH) organization is well staffed with five professional OSH staff, including the Safety Manager. One Industrial Hygienist (IH) is a Certified IH and a Professional Engineer with two masters degrees (IH and civil engineering). Another IH has a masters degree in environmental engineering. One other IH is working on a masters degree. An offer to a sixth professional IH was recently accepted. In addition, there are two IH technicians who support some aspects of S&GRP operations. The IH technicians are qualified using a "qual card" process where required reading is completed and skills are demonstrated.

The HAMTC Safety & Health Representative provides substantial occupational safety and health expertise, in addition to an effective interface between management and bargaining unit employees about safety related issues.

There has been growth in both OSH and Radiation Control organizations in the recent past, particularly the OSH professionals. This growth reflects good support for safety and health

expertise by S&GRP management. The Radiological Control organization has 21 RCTs and three radiological analysts, including the Radiological Control Manager. The organization includes two health physicists (one who was recently hired), and S&GRP has access to a Certified Health Physicist outside of the organization to support technical issues. Only one OSH/Radiation Control professional (an IH) is certified. While the professional expertise of S&GRP safety and health staff is very good, the technical capability and stature of S&GRP's worker safety and health program could be further enhanced by promoting (e.g., via incentives) professional certification for OSH/Radiation Control professionals.

The purpose of the S&GRP preventive maintenance program is twofold: to maintain equipment so it will operate as intended (including instrument calibration) and to mitigate potential safety issues. The process uses an automated Job Control System that lists all equipment identified as requiring preventive maintenance by the system engineer, and schedules the preventive maintenance based on the recommended frequency. The system generates a work package including the procedure, the hazard analysis (or AJHA for more complex/risky preventive maintenance), and a comment/approval page. Preventive maintenance in the field is performed by procedure, and any issues (including improvement opportunities) are listed in the comments by the worker. The system engineer reviews the package when it is completed, takes any corrective action, and closes the package.

When a preventive maintenance procedure is first initiated, the worker is involved in developing the procedure, validating the procedure in the field with the engineer and the supervisor, and sending appropriate changes to the coordinator for incorporation into the final procedure. The final procedure is approved by the engineer, supervisor, and maintenance manager.

Preventive maintenance of emergency equipment was reported to be good by several employees. New and improving facility/equipment design utilizes lessons learned from previous operating experience and is providing for better preventive and corrective maintenance.

All FH projects including S&GRP use the Project Hanford Management System, which provides corporate requirements documents on-line. Key document types applicable to safe work at S&GRP include the following.

- Policy (HNF-POL-xxxx) documents are guiding principles that influence or determine decisions or actions. They present a broad statement of values, principles, and acceptable business practices.
- Requirements Documents (HNF-RD-xxxx) convey requirements for compliance, but do not define the implementing processes.
- Management Directives (HNF-MD-xxxx) define temporary directions (not to exceed 3 months).
- Procedures (HNF-PRO-xxxx) present a series of steps to be followed in a regular, definite order to accomplish something.
- Practices (HNF-PRAC-xxxx) are used by construction forces (and subcontractors such as well drillers and loggers) to perform specific tasks. S&GRP subcontractors use Practices listed in HNF-23100.

S&GRP also uses project-level procedures to provide specific requirements, such as those related to requirements implementation and operation of facilities and equipment. Key examples of documents that informed this review include:

- Administrative Procedure RC-1-04 (Radiological) “*Work Planning Process;*” and
- Operating Procedure GRP-FS-04-K-100-001 “*100-KR-4 Pump-and-Treat Operating Procedure.*”

The procedures and other requirements documents that were reviewed were detailed and clearly written. There was evidence of an appropriate level of worker involvement in their development.

Conclusion

S&GRP demonstrates good hazard prevention and control through systematic processes, management leadership, employee involvement, worksite analysis, and safety and health training. Key areas where S&GRP exhibited strong hazard prevention and control include diligent use of PPE, an innovative approach to radiation protection for the unique issues associated with soil and groundwater remediation, growing professional expertise in safety and health, a good preventive maintenance program, and strong institutional safety and health rules. Several areas where improvement could further strengthen hazard prevention and control included:

- Documentation of the technical basis for moving into and out of RWPs during borehole operations;
- Communication of management expectations for certain aspects of hazard control (e.g., visitor access to pump-and-treat sites and use of the “two person” rule for higher-than-normal risk operations);
- Integration between procedures, HASPs, RWPs, and other work planning documents to ensure that all required steps are included in the work packages that are issued to employees;
- Emergency drills that address some of the most common types of emergencies that S&GRP workers are likely to encounter; and
- Professional certification of OSH Radiation Control staff.

VII. SAFETY AND HEALTH TRAINING

The safety and health training programs and processes at S&GRP are well structured and effectively implemented. The Integrated Training Electronic Matrix (ITEM) ties into a sitewide database that allows the training coordinators to identify and track training needs of S&GRP. Workers are trained at HAMMER to recognize hazards and perform work safely. Team interviews and overall observations confirmed that the training programs and processes are used and understood by personnel throughout the organization. The S&GRP Training Coordinator and Training Specialists are responsible for ensuring that the safety and health training provided to the workforce remains accurate and up-to-date. Everyone at S&GRP is responsible for implementing the safety and health training program.

Managers who were interviewed indicated that they had been given sufficient training in proportion to and within the scope of their authority and responsibilities for employee safety. They were able to describe their safety and health responsibilities, the hazards associated with jobs under their supervision, and the potential adverse effects on employees performing the jobs. They were aware of their overall responsibilities related to the general safety program. Managers are provided additional training that includes such topics as human performance improvement, employee concerns, leadership, and management assessments.

The supervisors' training plans require a combination of training that encompasses management and technical training. The supervisors are expected to attend the same training courses that the workers they supervise must take. For example, supervisors' training plans include courses in safety leadership and management assessment, in addition to courses such as pump-and-treat facility qualifications, planning radiological work, first aid and Automatic Electronic Defibrillators, fall protection, and basic crane and rigging safety.

Employees receive the appropriate training to do their jobs. Classroom training, on-the-job training, and computer-based training ensure employee knowledge and development of safe work practices to protect themselves, co-workers, the public, and the environment.

The Team confirmed through interviews, observations, and document reviews that each employee receives adequate training to work safely, commensurate with their job description, responsibilities, and authority. Every employee interviewed reported that they are taught how to protect themselves and others from the hazards of their jobs. An emphasis is placed on using workers to train workers through classroom and on-the-job training.

Orientation training includes the S&GRP safety philosophy, worker responsibility for safety, "Stop Work" responsibilities, and information about the safety committee. There is also an overview of the VPP. Employees must attend this training before performing their functions on the site. The orientation folder given to every new employee contains an S&GRP organization chart, glossary of groundwater terminology, safety and health policy (including the Worker's Bill of Rights and "Stop Work" policy), and a general overview of the groundwater program, work planning processes, safety requirements, EZAC, the S&GRP SIP, and VPP.

During the new-hire orientation, the employee is required to complete the HGET course and the S&GRP Facility Emergency Hazard Identification Checklist. Both courses are interactive,

computer-based courses. This training satisfies requirements for employee and long-term visitor access to the Hanford Site. For unescorted access to the Hanford Site, HGET covers basic information to enable the employee to work safely and in compliance with directives for computer and industrial security, emergency preparedness, environmental and waste management, hazard recognition, industrial safety and health, and radiological safety. The HGET course must be taken annually by every site employee.

Job-specific training when the employee starts on his/her particular function depends on the job being performed. For instance, at the pump-and-treat facilities, the Nuclear/Chemical Operators need to have the required certification to operate that system; they are then given a facility orientation by an experienced Nuclear/Chemical Operator. At a drill rig, the Buyer Technical Representative reviews the job and the safety analysis. The groundwater samplers use on-the-job training to train new employees.

Informal training updates the employees on day-to-day safety matters. Every morning managers, supervisors, and lead workers meet to discuss the day's activities. The activity leads then brief their employees on activities they will be performing at S&GRP worksites, assigns the day's task to the employees, and asks for general questions from the employees. There is a free flow of information exchanged during these meetings, and the employees feel free to ask any type of question. These meetings are an effective tool in getting the safety message out to the employees, thereby increasing employee knowledge of safety hazards and concerns both on and off the job.

Employees are encouraged to maintain additional certifications through the use of a weekly incentive bonus. For example, an employee who maintains certifications in three to six areas can earn anywhere from \$10 to \$52 a week, while an employee who maintains only one or two certifications does not earn the bonus. This practice encourages the workers to be certified in areas beyond their immediate jobs, allowing for greater flexibility for S&GRP when deploying their workers.

The employees are given safety messages and are encouraged to be aware of safety at home as well as work. Topics discussed included drowsy driving, back-to-school safety, and Halloween safety.

Subcontractor training requirements are identified through the contract, and the subcontractor is required to provide proof of training to the Training Coordinator. A training equivalency is conducted by the Training Coordinator to verify that the training is acceptable.

The Training Coordinator responsible for S&GRP (in addition to her other groups) accesses the training database on a routine basis and creates reports listing who is due for required training. This data is then forwarded to the S&GRP managers to notify the individuals who need the training. They are then scheduled for the training. The individual will typically receive three notices that they are due for training through the sitewide electronic scheduling system, from their manager, and from their administrative assistant. Training is usually scheduled at least three months in advance by the Training Coordinator. During the morning plan of the day

meetings, one of the agenda items includes a review of individuals scheduled for training that day and the next day.

A review of 23 randomly selected training records showed that 13 of the records were complete and up to date. Another six people have at least one required training course that is overdue. There are also five people who have required courses that are in a “not yet scheduled” status; one of these five is also in the overdue category. The Team found no evidence that workers were performing any work for which their training was overdue or qualifications had expired. There is evidence that the individuals were notified that the courses were due. The breakdown in the system does not appear to be in the notification process, but at the field level. This system appears to be effective in initially notifying workers and their supervisors when training is due, but is less effective in subsequently reminding them if training is not scheduled or completed in a timely manner.

Opportunity for Improvement: S&GRP should consider further automating the training record recall system to send out notifications and periodic reminders automatically to the Training Coordinator when a course is coming due so it can be scheduled, and to the worker and his manager so they can ensure that the worker attends the course before his/her training qualifications expire.

S&GRP’s emphasis on training over the last years is indicated by the rate of no-show fees they are charged. They used to have significant charges (approximately \$20,000 per year) for courses that were scheduled but the worker did not attend. That charge has been reduced to approximately \$4,000 indicating that attendance at scheduled training has greatly improved.

The training staff has recognized the need to review the current training plans to verify that the identified courses are still reflective of the individual’s training needs, and this effort is ongoing. S&GRP and FH are in the process of implementing the Human Performance Improvement training. This training is in the early stages and is focused on the managers, supervisors, and lead staff. The plan is to include everyone in the training in the near future.

Conclusion

The Team determined that management is committed to a strong safety and health training program for S&GRP managers, supervisors, and the employees, but there is a need to improve the completion rate for required training. Managers, supervisors, and employees know and understand the policies, rules, and procedures established to help prevent unnecessary exposure to the hazards associated with the workplace mission. The training program in place at S&GRP also contributes to employee ownership of safety and health programs.

VIII CONCLUSION

The S&GRP team has clearly demonstrated their commitment to safety excellence. In each of the DOE-VPP tenets, they have proven themselves capable of performing their mission safely. Their safety record in comparison to peer industries is excellent and demonstrating an improving trend. The standard for DOE-VPP participation is not perfection. In addition to better than average safety and health statistical performance, managers and workers must work cooperatively to establish and maintain a culture that pursues continuous improvement and excellence in safety. To that end, the Team identified several opportunities for improvement that managers and workers should cooperatively address to further improve safety. It is the Team's recommendation that the S&GRP be granted DOE-VPP Star status.

APPENDIX A

Onsite DOE-VPP Audit Team Roster

Name	Affiliation/ Phone	Project/Review element
Brad Davy	DOE/HSS 301-903- 2473	Team Lead Management Leadership
Carlos Coffman	DOE/HSS 301-903 -6493	Employee Involvement
Michael Gilroy	DOE/HSS 301-903-5326	Worksite Analysis
John Cavanaugh	DOE/RL 509) 373 - 9625	Worksite Analysis
Cathy Karney	DOE/KCP 816-997-5691	Safety and Health Training
James Bears	FM&T/KC-Honeywell 816-997-5899	Employee Involvement
Patrick Wright	PNNL 509-376-3016	Hazard Prevention and Control