Savannah River Remediation, LLC
Liquid Waste Contract
Savannah River Site

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
February 14-18, 2011

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

Foreword

The Department of Energy (DOE) recognizes that true excellence can be encouraged and guided but not standardized. For this reason, on January 26, 1994, the Department initiated the DOE Voluntary Protection Program (VPP) to encourage and recognize excellence in occupational safety and health protection. This program closely parallels the Occupational Safety and Health Administration (OSHA) VPP. Since its creation by OSHA in 1982, and DOE in 1994, VPP has demonstrated that cooperative action among Government, industry, and labor can achieve excellence in worker safety and health. The Office of Health, Safety and Security (HSS) assumed responsibility for DOE-VPP in October 2006. 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 Savannah River Remediation, LLC (SRR), the Savannah River Site Liquid Waste Contractor, during the period of February 14-18, 2011, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding SRR's continued participation in DOE-VPP.

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ABBREVIATIONS AND ACRONYMS

ARRA	American Recovery and Reinvestment Act
ALARA	As Low As Reasonably Achievable
AHA	Assisted Hazard Analysis
AQM	Automated Qualification Matrix
BBS	Behavior-Based Safety
BLS	Bureau of Labor Statistics
CAT	Consolidated Annual Training
CBT	Computer-Based Training
CFR	Code of Federal Regulations
DART	Days Away, Restricted, or Transferred
DNFSB	Defense Nuclear Facilities Safety Board
DWPF	Defense Waste Processing Facility
DOE	Department of Energy
EISM	Enterprise Integrated Safety Management
EPD	Electronic Personal Dosimeter
ESQB	Executive Safety and Quality Board
ETP	Effluent Treatment Project
FTF	F-Area Tank Farm
FY	Fiscal Year
GET	General Employee Training
HPI	Human Performance Improvement
HS-63	Office of Emergency Management Oversight
HSS	Office of Health, Safety and Security
HTF	H-Area Tank Farm
IDEAS	Individuals Developing Effective Alternative Solutions
IH	Industrial Hygiene
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
LSIT	Local Safety Improvement Team
MSDS	Material Safety Data Sheet
NAICS	North American Industry Classification System
OSHA	Occupational Safety and Health Administration
PM	Preventive Maintenance
POMC	Performance Objectives, Measures, and Commitments
PPE	Personal Protective Equipment
RCI	Radiological Control Inspector
RWP	Radiological Work Permit
SPDF	Saltstone Processing/Disposal Facility
SWE	Safe Work Environment
Team	HSS DOE-VPP Team
TOC	Tank Operation Contract
TPD	Training Program Description
TRAIN	Training Record Automated Information Network
TRC	Total Recordable Cases
VPP	Voluntary Protection Program

VPPPA	Voluntary Protection Program Participants' Association
SME	Subject Matter Expert
SR	Savannah River Operations Office
SRNS	Savannah River Nuclear Solutions, LLC
SRR	Savannah River Remediation, LLC
SRS	Savannah River Site
WSRC	Washington Savannah River Company

EXECUTIVE SUMMARY

The Department of Energy (DOE) Savannah River Site (SRS) is a Nuclear Materials Processing Center in the State of South Carolina, located on land in Aiken, Allendale, and Barnwell counties adjacent to the Savannah River, 25 miles southeast of Augusta, Georgia. SRS is approximately 310 square miles in size. Initially built during the 1950s to refine nuclear materials for deployment in nuclear weapons, the site has evolved to a multifaceted mission, including nuclear materials storage and management, nuclear stockpile management and support, environmental remediation, decontamination and decommissioning, liquid waste management, and nuclear fuel manufacturing.

In September 2000, SRS, managed by the Washington Savannah River Company (WSRC), was certified as a DOE Voluntary Protection Program (VPP) Star site and subsequently recertified in November 2003 and June 2006. In August 2008, operations work at SRS was separated into two contracts, one for the Management and Operations of SRS, and one for the Liquid Waste Operation of the site. The Liquid Waste contract scope remained with WSRC. On July 1, 2009, the Liquid Waste scope of work transitioned from WSRC to Savannah River Remediation, LLC (SRR). The SRR team is made up of URS, Bechtel, CH2MHILL, and Babcock and Wilcox.

Per DOE-VPP requirements, the 3-year recertification review was due in 2009. As a result of the contract change, SRR remained in DOE-VPP in a transitional status and submitted a modified application in September 2010 through the Savannah River Operations Office for recertification. The Office of Health, Safety and Security reviewed the application and conducted an onsite assessment to verify that SRR continues to meet DOE-VPP requirements as specified in the DOE-VPP Manual. Personnel from the Office of Worker Safety and Health Assistance and subject matter experts from across the DOE complex (referred to as the Team) conducted observations and interviews to ensure the tenets of VPP are adequately met. This report contains the results of that assessment and provides the necessary information for the Chief Health, Safety and Security Officer to make the final determination regarding SRR's continued participation in DOE-VPP.

Statistically, SRR clearly meets the expectations for continued participation in DOE-VPP at the Star level. A slight upward trend in recordable cases in the construction areas was evident and coincides with increases in the workforce under the American Recovery and Reinvestment Act. SRR has been working effectively to fully integrate these workers into the SRR safety culture, and overall rates remain a small fraction of the comparison industry rates.

Within each of the five tenets of DOE-VPP, SRR is demonstrating effective cooperation between managers and employees, with a clear dedication to effective Integrated Safety Management. Managers and workers alike are clearly proud of their safety performance and have developed an uncompromising attitude of accomplishing their mission safely. SRR will undoubtedly realize significant future benefit in expanding efforts to coach and mentor workers in applying human performance improvement and conduct of operations principles in every aspect of their work to ensure policies, processes, and procedures capture the knowledge and experience of the workers.

Worksite Analysis and Hazard Prevention and Control reflect effective cooperation with Savannah River Nuclear Solutions, LLC, to ensure previously identified weaknesses are adequately addressed. Improvements in these areas will contribute to making a working system

more effective and efficient. SRR has demonstrated effective use of elimination, substitution, or engineered controls rather than relying solely on personal protective equipment. Training and qualification programs for operators are rigorous, challenging, and ensure employees are appropriately trained to recognize hazards and to protect themselves and coworkers.

Based on these observations, the Team believes that SRR has adequately completed the transition from the previous contract and is fully deserving of recognition in DOE-VPP, and recommends that SRR continue to participate at the Star level.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
SRR should work with the Savannah River Operations Office to replace POMC goals related to TRC and DART rate with positive incentives directly linked to contractor actions that will prevent accidents and injuries.	**8**
SRR should consider using the VPP Core Team and the Local Safety Improvement Teams to develop subordinate goals derived from the POMC that include specific worker actions and link to positive performance indicators and incentives.	**8**
SRR should fully participate in the IDEAS program as a means of rewarding and stimulating additional worker input.	**10**
SRR should find ways to coach and mentor workers in identifying systemic improvements from safety observations and reward them for going above and beyond just identifying safety concerns.	**11**
SRR should ensure that the new 122 Procedure clearly indicates the expectation of capturing the analysis to explain why a control mitigates a particular hazard, other than those mandated by the "hazard tree."	**13**
SRR should reevaluate its application of suspension guidelines such that they provide meaningful levels for the analyzed radiological conditions.	**14**
SRR should increase its efforts to prevent workers becoming complacent about controls during routine tasks.	**17**
SRR should consider conducting more of its drills without advance knowledge to ensure more realistic responses.	**19**

I. INTRODUCTION

The Department of Energy (DOE) Savannah River Site (SRS) is a Nuclear Materials Processing Center in the State of South Carolina, located on land in Aiken, Allendale, and Barnwell counties adjacent to the Savannah River, 25 miles southeast of Augusta, Georgia. SRS is approximately 310 square miles in size. Initially built during the 1950s to refine nuclear materials for deployment in nuclear weapons, the site has evolved to a multifaceted mission, including nuclear materials storage and management, nuclear stockpile management and support, environmental remediation, decontamination and decommissioning, liquid waste management, and nuclear fuel manufacturing.

In September 2000, SRS, managed by the Washington Savannah River Company (WSRC), was certified as a DOE Voluntary Protection Program (VPP) Star site and subsequently recertified in November 2003 and June 2006. In August 2008, operations work at SRS was separated into two contracts, one for the Management & Operations of SRS, and one for the Liquid Waste Operation of the site. The Liquid Waste contract scope remained with WSRC. On July 1, 2009, the Liquid Waste scope of work transitioned from WSRC to Savannah River Remediation, LLC (SRR). The SRR team is made up of URS, Bechtel, CH2MHILL, and Babcock and Wilcox.

SRR is responsible for operation of the Liquid Waste Facilities in F-Area Tank Farm (FTF), H-Area Tank Farm (HTF), Effluent Treatment Project (ETP), Saltstone Processing/Disposal Facility (SPDF), and the Defense Waste Processing Facility (DWPF). SRR administrative operations are centrally located between these facilities in building 766-H. The Liquid Waste contract awarded to SRR is focused on emptying and closing the site's underground high-level waste tanks. These tanks contain approximately 36 million gallons of waste consisting mostly of salt material and a smaller amount of high-activity sludge waste. Specifically, SRR is expected to close 15 of the single-shell waste tanks by the end of the contract's 6-year base period, and to close an additional 7 tanks by the end of the 2-year contract option period. To accomplish this, SRR will produce at least 1,100 canisters of vitrified high-level waste at DWPF and another 400 canisters during the option period.

The high-level waste tanks at SRS constitute one of the largest, if not the largest, environmental risks in South Carolina. Movement of waste within the tank farms, evaporation of water to reduce volume, chemical treatment to inhibit corrosion, decomposition of organic materials, radiolysis of water to produce hydrogen, movement of sludge from the tank farms to DWPF, and transportation and storage of vitrified and solidified wastes all present risks to the workforce. In addition to radiological hazards, these facilities also share the same types of industrial and chemical hazards experienced by general industry. Hazards in the workplace are associated with operating pressurized process equipment, and ergonomic-related activities resulting in back/muscle injury and repetitive motion injuries. Explosion hazard potential also exists in facilities as the result of chemical reaction, over-pressurization of equipment or equipment failure. Other types of hazards involve hazardous energy and material handling operations with forklifts, elevators, cranes, hoists, and earthmoving equipment.

Contractually, SRR uses site procedures and programs that are developed and maintained by Savannah River Nuclear Solutions, LLC (SRNS). Both SRR and SRNS continue to maintain a single VPP Core Team. While both contractors understand that each must be certified separately under the VPP process to attain Star certification, both contractors are using a single-site integrated approach to implement the five elements of VPP.

The workforce at SRR consists of approximately 2,600 people, including skilled crafts, building trades, engineers, support staff, managers, and safety and health professionals. Construction personnel are collectively represented by the Augusta Building and Construction Trades Council, which has strongly endorsed SRR participation in DOE-VPP.

Per DOE-VPP requirements, the 3-year recertification review was due in 2009. As a result of the contract change, SRR remained in DOE-VPP in a transitional status and submitted a modified application in September 2010 through the Savannah River Operations Office (SR) for recertification. The Office of Health, Safety and Security (HSS) reviewed the application and conducted an onsite assessment to verify that SRR continues to meet DOE-VPP requirements as specified in the DOE-VPP Manual. Personnel from the Office of Worker Safety and Health Assistance (HS-12) and subject matter experts (SME) (referred to as the Team) from across the DOE complex conducted observations and interviews to ensure the tenets of VPP are adequately met. This report contains the results of that assessment and provides the necessary information for the Chief Health, Safety and Security Officer to make the final determination regarding SRR's continued participation in the DOE-VPP.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (SRR Operations)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	DART* Cases	DART* Case Rate
2008	3,410,572	3	0.18	1	0.06
2009	3,562,186	7	0.39	5	0.28
2010	4,104,849	5	0.24	2	0.10
3-Year Total	11,077,607	15	0.27	8	0.14
Bureau of Labor Statistics (BLS-2009) average for NAICS** #562211 Hazardous Waste Treatment and Disposal			3.7		2.7
Injury Incidence/Lost Workdays Case Rate (SRR Operations Subcontractors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2008	31,183 (estimated)	0	0.00	0	0.00
2009	23,411	0	0.00	0	0.00
2010	46,690	0	0.00	0	0.00
3-Year Total	101,284	0	0.00	0	0.00
Bureau of Labor Statistics (BLS-2009) average for NAICS** #562211 Hazardous Waste Treatment and Disposal			3.7		2.7
Total SRR and Subcontractors (3 Years)			0.27		0.14

Injury Incidence/Lost Workdays Case Rate (SRR Construction)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	DART* Cases	DART* Case Rate
2008	481,308	2	0.83	1	0.42
2009	431,376	2	0.93	2	0.93
2010	889,194	6	1.35	1	0.22
3-Year Total	1,801,878	10	1.11	4	0.44
Bureau of Labor Statistics (BLS-2009) average for NAICS** #2362 Nonresidential building construction			3.6		1.7
Injury Incidence/Lost Workdays Case Rate (SRR Construction Subcontractors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2008	49,916 (estimated)	0	0.00	0	0.00
2009	66,650	3	9.00	0	0.00
2010	70,306	0	0.00	1	2.84
3-Year Total	186,872	3	3.21	1	1.07
Bureau of Labor Statistics (BLS-2009) average for NAICS** #2362 Nonresidential building construction			3.6		1.7
Total SRR Construction and Constructions Subcontractors (3 Years)			1.31		0.5

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

TRC Incidence Rate, including subcontractors: 0.43
DART Case Rate, including construction and subcontractors: 0.20

Conclusion

The total comparison statistic for SRR is a weighted average of the two applicable NAICS codes. This weighted statistic is a TRC rate of 3.68 and a DART rate of 2.55. It is clear that the performance at SRR is significantly below the comparison industries. There is a slight upward trend in injuries for SRR self-performed construction, and this is generally attributed to the influx of construction workers under the American Recovery and Reinvestment Act (ARRA). For operations work, there was a small spike in injuries that may be attributable to the organizational stresses associated with contractor transition in 2009. A review of the accident and injury files revealed no concerns regarding classification of injuries, and workforce interviews did not indicate any concerns about underreporting of injuries. Statistically, SRR clearly meets the expectations for continued participation in DOE-VPP at the Star level.

III. MANAGEMENT LEADERSHIP

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

During 2010, SRR received State and national recognition for its safety performance from DOE; URS Corporate; the National Safety Council; and the South Carolina Labor, Licensing, and Review Board. The URS President's Award was presented to SRR in March 2010 for achievement of 2.5 million hours without injury/illness involving days away from work. This was achieved again in December 2010. The National Safety Council awarded the Million Hour award to SRR in March 2010 for achievement of 2 million safe hours. The South Carolina Department of Labor Licensing and Regulation awarded SRR the Certificate of Safety Achievement for a TRC rate of 0.35. SRR also had the lowest TRC rate among all Office of Environmental Management contractors in DOE.

The SRR management team consists of personnel with a long operating history at SRS. All levels of management have extensive experience at SRS, other DOE facilities, or both. The President and Project Manager (single position) recently left SRR and is being replaced by the Operations and Deputy Project Manager. The Deputy Project Manager has clearly set a strong example of leadership for the entire management team. Manager presence in the field and the workspaces is clearly a priority from the top of the organization down. Managers interviewed by the Team expressed a clear understanding of the business case for worker participation and involvement. The resounding message from all managers was the need to ensure work was properly planned and executed each time, every time. Several managers echoed the theme from the Deputy Project Manager that *Planning is done in the trailer; work is done in the field.* Managers stated that if workers found themselves planning the job at the time of work, they should stop and send the work back to the planners.

SRR is organized as a project, and has achieved a very high degree of integration between the separate facilities. SRR recognizes that each facility's operations is highly dependent on the other facilities and is effectively structured as a production organization. As such, managers are working to build more efficiency into operations. Consolidation of control rooms, development of mobile command centers, and use of new technology are all contributing to safe accelerated mission performance.

The SRR safety and health policies are included in the 8Q Employee Safety Manual, *Procedure 01, Safety Policy and Program Responsibilities*. Through the implementation of SRR's Integrated Safety Management System (ISMS), management's responsibilities for safety and health are clearly defined in a suite of SRS program manuals. Additional requirements are contained within the job descriptions for each management position. Senior management expectations are communicated to all levels of employees, including subcontractors, and full

compliance is expected. Safety policies and expectations are reinforced through many mechanisms, including posters, handouts to workers, safety messages, and safety campaigns.

SRR employs approximately 300 environment, safety, health, and quality support personnel. Managers were intensely aware of the challenges they face regarding completing the mission ("22 in 8") with the resource limitations established by the contract and DOE. These resource limitations have been effectively managed to support continuous, efficient project execution. The strong support for effective planning has clearly grown from the need to ensure resource loads are leveled and ensure the appropriate expertise and experience are available to the workers. SRR has also instituted cross-training of workers, such as training some Radiological Control Inspectors, on the use of five common industrial hygiene (IH) instruments and using construction personnel to supplement other work where appropriate. This cross-training serves to not only provide more flexible assignment of personnel, but also helps workers gain a greater sense of accomplishment and participation in the work.

SRR has also committed significant resources to support community outreach in connection with VPP participation. That outreach has included mentoring and support to other URS sites, support for DOE-VPP onsite assessments, presentations at both the Voluntary Protection Program Participants Association (VPPPA) Regional and National conferences, and co-hosting the 2010 Annual Integrated Safety Management Conference with SRNS. In addition, SRR has been an active supporter for many community-based charitable organizations. Recently, SRR implemented a program providing contributions, typically $500, to local organizations based on worker safety performance. The organizations are selected by the Local Safety Improvement Teams based on worker suggestions.

Recognition of the need to perform work correctly the first time has also produced strong manager support for the use of mockups. The use of several different types of mockups has frequently led to more efficient work practices, safer work practices, and the development of innovative work methods. For example, workers in the tank closure project have been using mockups to test the use of robotic sampling methods. Using the mockups, workers have identified several changes to the sampling methods, as well as improved the design of the robot. Managers have been fully supportive of these efforts by workers. The use of mockups is discussed further under Worksite Analysis.

Managers interviewed by the Team expressed a clear sense of pride in the workforce. Managers recognized and appreciated the skills of the workers and clearly understood their management responsibility to ensure those worker skills were supported by robust, reliable, quality systems to manage and safely accomplish the mission. Managers clearly delineated their expectations that workers must not rely solely on their own skill and knowledge, but use the processes and procedures.

Control of subcontractors as observed by the Team was effective. All applicable safety and quality requirements are included in subcontracts. SRR has an effective process for evaluation, selection, and subsequent monitoring of subcontractor performance. This process ensures that subcontractors fully understand the scope of work, as well as safety, health, environmental, and quality expectations before bids are submitted. Subcontractors must meet minimum safety performance thresholds. Once subcontracts are awarded, the subcontractor's performance is closely monitored by subcontractor technical representatives, who have access as needed to SMEs, safety and quality personnel, and facility personnel to ensure subcontractors comply with the appropriate standards in the performance of work. This process has been particularly

effective in the control of subcontractors used to perform work under ARRA. SRR was awarded $200 million under ARRA to accelerate project completion.

SRR has established an Executive Safety and Quality Board (ESQB) that meets regularly to review performance related to environment, safety, health, and quality. The ESQB includes review of a suite of performance indicators that are used to identify trends or impending problems and make management decisions to correct problems, align resources, and modify project plans. In addition to the ESQB, SRR managers use several other forums to include and integrate safety into project management. Management Review Teams, Facility Evaluation Boards, Management Field Observations, Senior Staff meetings, and Facility Radiological Action Teams all provide managers with the opportunity to review work activities, ensure work planning processes are effective, and reinforce management expectations and priorities.

Each year, SRR performs an annual assessment of its performance in connection with VPP. That assessment is structured around each of the tenets of VPP, and includes all aspects of the original VPP application. Improvement opportunities are specifically called out where identified. The assessment report is exceptionally informative regarding specific activities at the site in connection with VPP. There is a potential drawback in that this process has not been well integrated with other self-assessments performed on an annual basis, leading to redundancy of effort in many cases. As a means of improving the process and eliminating redundancy, SRR is attempting to incorporate the VPP tenets into other site assessments where appropriate (e.g., the annual ISMS declaration and Facility Evaluation Boards). The Team supports and encourages this approach.

SRR works with SR on an annual basis to negotiate annual Performance Objectives, Measures, and Commitments (POMC), which form the basis for the annual contract performance award. Those POMCs are published in the annual Safety Improvement Plan, which is provided directly to workers. The POMC for fiscal year (FY) 2010 and FY 2011 contained several positive actions focused on safety improvements. The Team was concerned, however, there are annual POMCs tied directly to TRC and DART rates. In his opening remarks at the Voluntary Protection Program Participants' Association (VPPPA) National Conference in August 2010, Assistant Secretary of Labor for Occupational Safety and Health, Dr. David Michaels, stated:

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

The VPPPA has supported this position for several years, and HSS agrees. While TRC and DART rates are used as the comparison statistic across industries, the use of that statistic in connection with contract award fee can be construed as a negative reinforcement. Recognizing this potential, DOE has been closely reviewing accident and injury statistics in connection with VPP assessments and interviewing workers specifically about their willingness to report injuries. During this assessment, there were some indications that workers might be hesitant to report minor injuries, but there was no indication that workers were not reporting injuries. Further, SRR injury and illness rates for the past 2 years were already far below the POMC goals for FY 2011. SRR should work with SR to replace POMC goals related to TRC and DART rate with positive incentives directly linked to contractor actions that will prevent accidents and I njuries.

Opportunity for Improvement: SRR should work with the Savannah River Operations Office to replace POMC goals related to TRC and DART rate with positive incentives directly linked to contractor actions that will prevent accidents and injuries.

As another improvement, SRR should consider using the VPP Core team and the Local Safety Improvement Teams to develop subordinate goals derived from POMC. This process could provide greater clarity to the workforce on how its actions can directly influence the annual award fee for the Company. Those subordinate goals should be linked to specific actions workers can take and also provide the basis for performance indicators that can be publicized to the workforce on a regular basis.

Opportunity for Improvement: SRR should consider using the VPP Core Team and the Local Safety Improvement Teams to develop subordinate goals derived from the POMC that include specific worker actions and link to positive performance indicators and incentives.

Conclusion

The SRR management team is fully engaged and supportive of continuing excellence in safety and health and recognizes this excellence as an essential element of completing its mission. Managers are well integrated across functional lines and clearly recognize the importance of providing effective, efficient processes to help workers perform safely every day. Managers are clearly visible, available, and responsive to the workforce. SRR fully demonstrates the Management Leadership and commitment expected of a DOE-VPP Star participant.

IV. EMPLOYEE INVOLVEMENT

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

SRR provides many opportunities for workers to get actively involved. Team observations and interviews effectively demonstrated that SRR clearly values input and involvement of the workforce. This input has been used extensively, not just to identify and correct safety issues, but to improve work processes and mission execution. SRR workers are actively engaged in performing behavior-based safety observations, implementation of human performance improvement initiatives, work planning (including hazard analysis), pre-job briefings and post-job feedback, and safe performance of work. To encourage employee participation, SRR has placed electronic photo displays in various locations showing the employees working in that area or on that project. This photo display goes through a variety of pictures and helps contribute to the employees' sense of pride and ownership.

The use of the interactive *reverse pre-job briefing* system, in which the workers are required to individually repeat back to the team leader the hazards, controls, and procedures to be followed, has been highly successful. This systematic process assures that the mental framework is in place to complete the job successfully. The format used throughout all operations is the *SAFER* system (Summarize critical steps, Anticipate error-likely situations, Foresee consequences, Evaluate defenses, and Review lessons learned).

Workers are confident that they are empowered to perform work safely. All workers encountered by the Team felt comfortable in their ability to take a *timeout* anytime it was needed to get additional information, clarify expectations, and, in general, make sure the job could be performed safely and effectively the first time, every time. SRR has made specific efforts to train work supervisors in effective techniques to lead pre-job briefings, and that training is demonstrably effective.

Workers have initiated and implemented several activities to help focus their coworkers on unanticipated hazards in the workplace. For example, workers developed a visual reminder known as *Drop-Dead-Fred*. Drop-Dead-Fred is a chalk outline of a body on the ground, which may be randomly placed around a facility. In connection with the outline, a note is posted calling workers' attention to nearby hazards or potential unsafe behaviors that workers might have become complacent about, or that is related to an ongoing safety campaign. Similarly, at DWPF, workers developed *Mike the Mannequin*, a visual-aid calling workers' attention to a variety of safety awareness issues. SRR has had many other worker-initiated safety awareness activities that were equally praised by workers and managers.

Employee involvement is fundamentally driven by a variety of committees that contribute to the safety program. The VPP Core Team is a joint effort between SRR and SRNS. This committee

was in existence prior to the new contracts, and both contractors have committed to maintaining a joint VPP Core Team. Committee members are knowledgeable, experienced, and dedicated and have been a key element in guiding SRR to continued excellence.

SRR has continued its commitment to behavior-based safety (BBS) through the local safety improvement teams (LSIT). LSITs were originally chartered solely to implement BBS at the facility level. They are responsible for collecting data through observations, reviewing and analyzing that data for trends, and then identifying and implementing corrective actions and safety campaigns to address potential trends. In some cases, the LSITs have taken it upon themselves to expand their role at the facilities into safety initiatives that go beyond the BBS implementation. In so doing, these LSITs have become a key participant in SRR efforts to maintain VPP Star status. SRR may want to consider expanding the roles of the LSITs, in general, to become more involved in local implementation of VPP efforts.

SRR has good funding for employee recognition for FY 2011. Resources for employee recognition are provided by DOE, SRR (from fee), and also by the parent companies. These resources are used to provide instant recognition in the form of gift cards, the Spirit of Excellence peer recognition program, and others. Although well-funded, few workers interviewed by the Team were aware of these recognition programs. In one particular case, SRR managers chose not to participate in the Individuals Developing Effective Alternative Solutions (IDEAS) program. This effort, begun under the previous contractor as a means of stimulating and rewarding worker input, has been continued by SRNS. SRR decided not to continue a similar effort. Of note is that the IDEAS program manager for SRNS reports that SRR workers have continued to submit suggestions through the IDEAS program, even though they are ineligible for awards under the program. From a budget of $200,000, the SRNS IDEAS program returned nearly $24 million in estimated cost savings and reductions in FY 2010. SRR should reconsider participation in the IDEAS program as a means of rewarding and stimulating additional worker input.

Opportunity for Improvement: SRR should fully participate in the IDEAS program as a means of rewarding and stimulating additional worker input.

Although SRR provides a myriad of opportunities for employee involvement, most of those opportunities are being driven by a small population of the workers. Given SRR's already excellent safety and health performance, efforts to prevent complacency and drive additional improvement are going to require much broader participation by the workforce. Driving this participation will take concerted efforts by workers and managers. A key opportunity for greater participation can probably be found through mentoring and coaching of workers to ask themselves hard questions related to their individual safety observations. For example, the Team was made aware of a trainee that observed a pickup truck with material extending more than four feet beyond the bed of the truck into a walkway. The worker brought the situation to the attention of an instructor, who subsequently identified the correct personnel to get the truck moved. The trainee was given a small award in recognition of his identifying the situation. Unfortunately, no other investigation or evaluation was performed by the workers involved to identify the factors that led to this situation, such as specific procedural requirements, training, or other means of ensuring drivers appropriately secure loads and park them safely. In another instance, the Team observed the use of trucks to transport radioactive materials within the HTF area. In some cases, the loads extended above the sides of the truck bed. When questioned, some workers reported that the trucks were authorized for movement of materials, but the loads

should not be above the sides of the bed. When the Team reviewed the applicable procedures, no reference to this control was included in the procedure. These examples demonstrate opportunities for workers to be more proactive in reviewing and using procedures, questioning their methods, and ensuring their personal practices meet expectations, or ensuring good practices that have developed are systematically captured in procedures and training. SRR should find ways to coach and mentor workers in identifying systemic improvements from safety observations, and reward them for going above and beyond merely identifying safety concerns.

Opportunity for Improvement: SRR should find ways to coach and mentor workers in identifying systemic improvements from safety observations and reward them for going above and beyond just identifying safety concerns.

Conclusion

Employee involvement is a strength of the SRR safety program. SRR provides employees with multiple opportunities to participate on safety committees and identify process and safety improvements. In addition, employees are encouraged to use the timeout process to ensure work is performed safely and effectively. The next major improvement for SRR probably lies with encouraging workers to ask difficult questions regarding safety observations, and use those workers' observations to identify potentially systemic weaknesses or improvements. SRR clearly continues to meet the expectations for Employee Involvement.

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.

SRR uses a documented system maintained by SRNS that captures the hazards encountered by workers as they perform job functions across SRR. The SRNS programmatic documents are implemented by SRR and augmented by SRR facility-specific procedures and work packages to fulfill the SRR requirements for facility operation. Although *owned* by SRNS, the programmatic documents are agreed upon by both contractors such that mutual benefit and programmatic continuity is maintained. The Team reviewed the report on DOE's ISMS review of SRR, performed June 21, 2010, to July 2, 2010. The DOE ISMS review team concluded that ISMS is fully implemented by SRR. The DOE ISMS review team report had 1 finding and 14 opportunities for improvement. The finding indicated that not all procedures at DWPF (two laboratory procedures) had a documented hazard analysis performed; there were no identified programmatic breakdowns or major deficiencies. In August 2010, SRR submitted an ISMS improvement plan to address the identified issues found by the DOE ISMS review team. As of February 18, 2011, the 1 finding and 13 of the 14 opportunities for improvement have been closed.

Manual 8Q, *Employee Safety Manual*, contains the Task Level Hazards Analysis procedure (Procedure 122, Rev 4) for use by SRR and SRNS. SRR uses this procedure in conjunction with the Assisted Hazard Analysis (AHA) software to identify, analyze, and develop controls for work activities. The software is an effective tool that walks the users through a series of questions to evaluate the hazards and develop the controls. Unfortunately, the software has a weakness that does not capture the logic for control selection. During the 2010 DOE-VPP review of SRNS, this weakness was identified by the Team as an opportunity for improvement. (http://www.hss.doe.gov/HealthSafety/wsha/vpp/reports/reports.html)

A revision to Procedure 122 has been developed by SRNS and SRR for use across SRS, but has not been released for use. The Team was briefed on the upcoming changes to the procedure during this review. Section 5.4.1 of the revised procedure indicates that there are mandatory controls for some hazards in the AHA *hazard tree*. The *hazard tree* is a compilation of mandatory controls for specific hazards. These mandatory controls would include, but are not limited to, Lock out/Tag out, fall prevention, confined space entries, use of ladders, and arc flash protection. Section 5.4.1 goes further to encourage the use of free text fields for the planner or SME to write in customized or facility specific controls applicable to the work activity. In addition to the free text field, for each hazard control an *additional text* field is provided within the AHA for documentation of any conditions applicable to the control. The revised procedure does not specify documentation of the rationale/logic for control selection for other than mandatory controls contained in the *hazard tree*. When implemented and provided an

opportunity to mature, this change will partially address the weakness identified in the 2010 SRNS VPP review.

Opportunity for Improvement: SRR should ensure that the new 122 Procedure clearly indicates the expectation of capturing the analysis to explain why a control mitigates a particular hazard, other than those mandated by the "hazard tree."

The Team reviewed several work packages in F-Area and H-Area Tank Farms and attended prejob briefings for ongoing or emergent work. The prejob briefings were satisfactory with mostly all issues concerning hazards and controls being discussed. Worker involvement was apparent and included questions and clarifications on work evolution and reminders of hold points and radiation protection requirements. Additionally, the Team shadowed a work planner developing a work package for emergent work in the H-Area. The planner made good use of available historical information and input from experienced workers regarding similar work in the past to help plan the upcoming work. Based on other interviews with workers and planners, this approach is normal at SRR for initiating and planning emergent work.

SRR has a robust work area evaluation program. Managers and workers perform weekly walkdowns of work areas to identify issues and suggest improvements. For example, in F-Area the Tank Farms/ETP Deputy Facility Operations Manager leads these teams, including *dressing out* and entering contaminated areas, to evaluate ongoing work and to identify issues before they become hazards. The team rotates the workforce participation, thereby developing a proactive culture to correct problems before they arise.

SRR uses several means to develop work packages and address hazards. In addition to pulsing experienced workers and researching historical work packages, the use of mockups is employed to identify hazard avoidance techniques and improve the work evolution. Mockups allow refinement of work in a "clean" environment to maximize efficiency and minimize exposures. Reviewing lessons learned from previous work also provides a resource for incorporating good work practices and avoiding hazardous conditions. One of the continuing themes voiced by managers and planners was that good planning eliminates the need to stop jobs and reevaluate workflow, thereby doing the job right the first time.

SRR has instituted a Facility Radiological Action Team to evaluate highly hazardous or complex activities. This team provides an additional review to ensure the planning is adequate for proposed work especially in high radiation, high contamination, or high airborne contamination areas.

SRR has implemented a new IH tool to capture sampling information, such as sound measurements and breathing zone sampling, and provide a repository for institutionalizing corporate knowledge relating to job hazards and controls. The new system is called Enterprise Integrated Safety Management (EISM) Exposure Assessment. This effort is only 3 months old and has yet to be populated with sufficient information to become an effective tool. SRR believes that once populated and validated it will serve as a very useful resource for job planning. One of the challenges, once implemented, will be to merge the tool's output with the current AHA process to facilitate addressing hazards and provide additional rationale for controls based upon measurements, samples, and experience.

A review of the Radiological Work Permits (RWP) in several work packages consistently showed very high dose rates for suspension guidelines (those levels at which work will be suspended). Site workers explained the extremely high level was to minimize the rewriting of RWPs because these were the levels measured inside the tanks. DOE provides guidance on acceptable practices for radiological control in DOE-STD-1098, *Radiological Control Standard*. Section 315, *Technical Work Documents*, and Appendix 3E discuss radiological control limiting conditions, which provide conditions that, if encountered, require some action, such as stopping work. Ideally, the radiological control limiting condition is established at a level where unforeseen radiological conditions are quickly identified and work is stopped to allow reevaluation of the radiological hazards. The DOE *Radiological Control Standard* provides several examples of reasonable methods for establishing radiological control limiting conditions.

For example, Appendix 3E of the standard states that for establishing extremity dose rate limiting conditions:

> *Where the expected dose rate is ≥ 1,000 mRem/hr, consideration may be given to using a limiting radiological condition equal to 1.5 times the expected dose rate, provided that the limiting condition does not exceed the expected dose rate by more than 10,000 mRem.*

Site Procedure 504, *Radiological Work Permit*, provides direction on site expectations for completing RWPs. Section 5.1.3 and Attachment 1 discuss RWP suspension guidance. The stated purpose of the suspension guidance is to *establish meaningful levels that control the hazard while allowing work to proceed when risks are acceptable*. Attachment 1 to Procedure 504 provides example guidance for determining radiological suspension guides. The examples were generally consistent with DOE's guidance in DOE-STD-1098.

The Team reviewed several RWPs where it was apparent that the example guidance from Attachment 1 of Procedure 504 was not being used. For example, RWP 11-FTF-137 had extremity doses of 30 mRem/hr, yet the suspension guide for extremity dose rates was a factor of 1000 times higher at 30,000 mRem/hr. This suspension guide far exceeds the guidance in the DOE *Radiological Control Standard* (1.5 times the expected dose rate not in excess of 10,000 mRem). There were numerous examples where the suspension guide for skin dose, whole body dose, and extremity dose were significantly higher than the anticipated levels. In most cases, much lower limits were identified in the work packages, but those limits were not identified on the RWP. It did not appear that establishing such high suspension guides would represent meaningful levels that control the hazard while allowing work to proceed when risks are acceptable.

Opportunity for Improvement: SRR should reevaluate its application of suspension guidelines such that they provide meaningful levels for the analyzed radiological conditions.

SRR tracks and trends a variety of items associated with performance and safety indicators. For example: injury metrics, contamination events, occurrences, and BBS observations are just a few of the many items that are tracked and evaluated. One of the challenges, as their safety culture continues to mature, will be to find new leading indicators to assure a continued improving safety culture, quest for excellence, and minimize complacency with the status quo.

Conclusion

SRR has well-established programs for developing work packages and performing work. The workforce is mature with a high confidence level that the work can be performed safely. SRR's safety record and rework frequency confirms that work is being planned effectively. SRR can benefit by assuring that the implementation of improved worksite analysis procedural changes incorporate the intent of this tenet to capture and institutionalize the logic for control selection. SRR should also review the identification of radiological work suspension limits to ensure they provide appropriate limits for the work being performed. SRR meets the Worksite Analysis tenet. The commitment of resources to the implementation of the EISM that is now underway will enhance the performance of the IH program throughout the facility.

VI. HAZARD PREVENTION AND CONTROL

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

SRR has established effective hazard controls with regard to the hazard control hierarchy. For example, SRR substituted the use of theatrical smoke to replace a more hazardous irritant smoke for use during drills and exercises. The Team observed use of the theatrical smoke during a drill in the H-Area Tank Farm, and it provided effective simulation without the additional risks associated with the use of irritant smoke.

SRR has implemented effective engineered controls throughout their processes. For example, the controls implemented for heat-stress were excellent. In addition to the usual access to adequate water and established break times mandated by a typical heat-stress program, SRR also used cooling vests, air-conditioned tents for workers in the field, ice barrels to cool breathing air being supplied to workers in air-fed suits, forearm immersion tanks, and alternate work scheduling (nighttime work), when possible.

In high radiation areas, SRR uses Teletrex alarming electronic personal dosimeters (EPD) that allow real-time monitoring of radiation exposure and dose rates while workers are in radiation areas. The Teletrex EPDs are continuously monitored during the work iteration by trained operators. If a worker approaches or exceeds the predetermined exposure or dose rates based on the work package limits, they are alerted by the operator to either move to a lower dose area or exit the area for reevaluation.

Command and Control Trailers provide a centralized control point for a variety of tank farm operations. Camera monitors, remote dosimeter monitoring, or other control functions can be more effectively used than if they were located outside. Putting these functions in close proximity to the work area allows more effective and timely monitoring and control.

The Team also observed the effective use of quiet breathing air compressors and the posting of sound barriers, which were real time monitored and posted for sound levels prior to each use by IH.

Another example of engineered alternatives includes remote-controlled robots that are being developed to support tank closure activities. The robots will permit more effective sampling of materials remaining in the tanks and allow more accurate characterization for closure, while dramatically lowering worker exposure levels.

In order to improve the availability of trained personnel, SRR has trained some Radiological Control Inspectors (RCI) on the use of five common IH instruments. The training included an overview of IH fundamentals, use of Lotus Notes documentation, and the successful demonstration of proficiency. This program was developed because of limited IH resources and an anticipated increase in workload. RCIs were selected as a logical choice for off-shift

monitoring because they come from a similar discipline and are intimately involved with the facilities. Because of this initiative, SRR recognized the efficiency in cross-training the RCIs to increase IH-monitoring potential in radiological areas.

As a last resort, SRR requires the use of PPE. Team observations indicated appropriate PPE was specified for the work performed and workers used that PPE effectively.

However, Team observations did identify some weaknesses in the hazard controls area in certain areas. Labeling on some cabinets containing air sampling equipment in F-Area stated: *Danger, Electrical Hazard*. The cabinets had been evaluated and electrical hazards were abated, but the labels identifying them as *danger* were not removed. These observations were discussed with site personnel and actions to correct them were initiated.

Team observations also suggested that some instances of complacency could be creeping into the hazard control process at SRR. For example, several types of equipment (radios, paperwork, etc.) being passed over Radiological Buffer Areas boundaries without proper adherence to established surveying requirements were noted. In most cases observed, the individuals were aware of the control requirements, but time constraints or miscommunications between personnel typically contributed to the controls being neglected. In addition, a material movement using a crane (two minor lifts) was observed at the ETP that failed to establish appropriate access control barricades during the lifts. In this case, the crane operator and the two ironworkers were originally tasked to remove the crane from its location. Upon arriving at the site, laborers requested the crane operators to perform two minor lifts from the materials laydown yard into the enclosure where the laborers were working. The crane operators obtained approval for the increased scope in work from their supervisor. In the process of performing the task, they failed to establish appropriate barricades for vehicle and pedestrian traffic under the flight path for the load. Although no personnel or vehicles entered the load path during the lifts, controls to prevent personnel entering the load path were not established prior to the lift. SRR construction group managers and workers agreed that the change in scope most likely contributed to the failure to appropriately establish the required controls. All other crane activities observed by the Team met SRR established controls. SRR should increase its efforts to prevent workers becoming complacent about controls during routine tasks.

Opportunity for Improvement: SRR should increase its efforts to prevent workers becoming complacent about controls during routine tasks.

The procedural requirements of SRR's preventive/predictive maintenance programs are found in 1Y, *Conduct of Maintenance*, Procedures 5.02 and 5.05. Procedure 5.05 establishes responsibilities and guidelines for the implementation of a Predictive Maintenance Program for SRR. This procedure specifically applies to Structures, Systems and Components maintained by SRR. These activities provide a high degree of confidence that facility systems function in a safe and reliable manner, that equipment degradation is minimized, and that equipment life is optimized using a cost-effective, graded approach. Preventive maintenance is scheduled and tracked through the Asset Suite system. Backlogs are also tracked using performance indicators to ensure that critical systems are maintained properly. Line management addresses all backlogs on a monthly basis through the plan of the month meetings. The Team's review of the maintenance backlog determined that the backlog is manageable. Corrective maintenance activities observed were performed safely with appropriate controls utilized.

Overall, the Radiation Protection Program at SRR is mature and effective. Team observations noted appropriate radiological control personnel were present or available during radiological work activities. They were knowledgeable of the work being performed and aware of the appropriate limits and controls. However, one opportunity for improvement was observed regarding the elevated suspension limits for contamination and dose rates specified in the RWPs (see Worksite Analysis section).

The SRS Emergency Preparedness Organization, which includes SRR personnel, develops and implements plans, procedures, and strategies to minimize the occurrence of emergency events and to demonstrate the readiness and ability of the site and its facilities to respond adequately should an emergency occur. Emergency preparedness drills are conducted throughout the year at various facilities. The Site Emergency Response Organization participates by staffing the Emergency Operations Center to provide support to the staffed satellite control rooms in the facilities. Emergency response personnel are required to participate in at least one drill/exercise per year and complete annual refresher training to maintain qualifications. The annual site exercise involves several community response organizations (e.g., Fire Departments, paramedics, HazMat Teams, environmental health agencies, offsite medical facilities, offsite State and local emergency management, etc.).

In January 2010, the Office of Emergency Management Oversight (HS-63) performed an emergency management inspection of SRS. SRNS is responsible for the emergency management program at SRS. The HS-63 inspection determined that the efforts of SR and SRNS managers and staff have been successful in addressing most of the key emergency management program weaknesses noted during previous inspections. The report concluded that, overall, SRS has implemented a mature, comprehensive, and well-documented emergency management program whose programmatic elements and site emergency response are well-governed by the site emergency plan and complemented by a thorough set of implementing procedures. Although a few weaknesses warrant management attention, the SRS emergency management program is consistent with DOE expectations and is capable of protecting site responders, site workers, and the public from the range of analyzed events.

One emergency drill observed by the Team during the review was performed at DWPF to test the emergency response skills of a group of new student operators who were in a training class. The scenario involved a fire in a neighboring trailer, but also included one of the students experiencing an injury during the evacuation. The students were not alerted to the drill until the exercise was initiated. While the students' response demonstrated appropriate knowledge of their required actions, several weaknesses were identified regarding response personnel communications with the site incident commander. For example, the response personnel readily responded to the fire; however, they were unaware of the existence of the injured student for several minutes due to a lack of communication between facility personnel and the responders and the fact that the students had evacuated to an area obscured by other buildings.

Immediately following the conclusion of the drill, a post drill review (hot wash) was performed with all drill participants, including the site emergency responders. Both the fire department personnel and first-aid providers spoke with the participants regarding key elements of their roles and responsibilities during an event. The drill leader then discussed the strengths and weaknesses observed during the drill and used an effective technique of involving all participants through an interactive question and answer methodology. While some weaknesses were identified during the drill, the response by the participants was very good. The strengths and weaknesses observed were captured in the formal post drill critique and documented in a report.

Several other drills conducted during the review or reported to the Team involved repeated advance announcements of the drills occurrence. In order for the drills to be most effective, SRR should consider conducting more of its drills without advance knowledge to ensure more realistic responses.

Opportunity for Improvement: SRR should consider conducting more of its drills without advance knowledge to ensure more realistic responses.

SRNS provides medical services to SRR. Occupational medical professionals participate in worker safety and health team meetings and committees to improve worker health services. The program provides for onsite response to medical emergencies, treatment of on-the-job injuries and illnesses, medical evaluations concerning the ability to work and return to work, and evaluation of potential occupational impacts to employee's health and wellness. The site Medical Department offers case management assistance for occupational illnesses and injuries and disability program support as requested. Offsite medical resources are used when the nature of the injury warrants.

There is excellent coordination and communication with SRNS for purposes of lessons learned, including immediate notification of on-the-job injuries and illnesses. SRR published information related to injuries, including pictures, is disseminated to all SRR employees and subcontractors by way of a *Safety Flash* alert system as a lessons learned tool. An example of this was the recent issuance of a *Safety Flash* for a construction worker hand laceration incident involving a razor blade lodged in a roll of duct tape. Information was shared to prevent recurrence of similar injuries.

Conclusion

SRR demonstrated an effective hazard control process. The effective utilization of substitution and engineered controls was clearly evident. While some observations indicated a potential for complacency may exist in some areas of the hazard control process, the majority of observations indicated an effective hazard control process. SRR has satisfied the element for Hazard Prevention and Control.

VII. SAFETY AND HEALTH TRAINING

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

Training and qualification programs are well established to ensure that all employees receive appropriate training to recognize hazards of the work environment to protect themselves and coworkers. The training process is systematic and provides the requisite knowledge, skills, and abilities to perform tasks competently and safely. It applies to all employees and all aspects of SRR operations, design, procurement, construction, and support activities.

Most of the safety and health training is provided by SRNS and consists of classroom training, computer-based training (CBT), and on-the-job training. Training provided by SRNS includes the General Employee Training (GET), the Consolidated Annual Training (CAT), the Radiological Worker I and II Training, the Resources Conservation and Recovery Act Training, and Confined Space Training. SRR provides operator and site-specific training which is discussed later in this section. Newly hired employees are required to complete the 8-hour GET and pass a written test with a minimum score of 80 percent prior to receiving a site badge. All employees must complete the CAT in January of each year to retain their badges and site access. GET and CAT training is comprehensive, covers most of the safety topics, and contains a good discussion of ISMS, VPP, BBS, and Human Performance Improvement (HPI).

When required by their job function, workers are provided additional safety and health training that focuses on specific hazards identified for that job task. While most of the training is CBT, there are some classroom courses led by instructors. Some courses, such as the Radiological Workers Practical, Plastic Suit and Hood Airline Respirator, and Negative Pressure Training, have proficiency components that require hands-on demonstration. SRR also uses mockups to simulate actual field conditions under which employees would perform the work activities.

SRR provides extensive operator training in fundamentals provided to all operators followed by facility-specific training in the facilities to which they are assigned. Fundamental training includes math, physics, heat transfer, fluid flow, chemistry, nuclear science, mechanical and electrical sciences, and instrumentation and control. Trainees currently in the program explained that health and safety topics, including VPP tenets, were introduced at an early stage in the training. This training takes 6 to 8 months to complete and includes passing written examinations. Facility-specific training includes classroom and operational training in the field. The operator must pass operational evaluations and demonstrate proficiency in operations to the shift superintendent and training staff before receiving qualification cards, which require recertification every 2 years. The operators must take refresher training to keep their qualifications current. This process effectively ensures personnel retain proficiency in the requisite knowledge and skills to perform their operational duties.

All employees are required to attend a monthly safety meeting of their organization and view the SRS Spectrum Safety Video. The Spectrum videos are about 15-minutes long and are produced monthly by the Communication and Media group of the Public Affairs Department of SRNS. It contains discussion of a safety topic of current interest. SRR's Environment, Safety and Health

department provides other monthly safety meeting materials, which volunteers within the work group/department use to present safety topics at these meetings. For example, the January 2011 safety meeting materials included discussion on VPP, and the February 2011 materials included a review of the Six Basic Safety Procedures at SRR. The March 2011 materials focus on management of heat stress.

In addition to the safety and health training provided to all employees, the supervisors are provided enhanced training in conducting prejob briefings, hazard analysis, and communication techniques so they can provide effective, efficient briefings to workers and ensure workers are actively engaged. That training specifically included the use of a *reverse prejob brief* where workers are asked questions or provide information on their specific responsibilities or actions. This technique was observed in practice and was effective in improving the quality of prejob briefs. Further, at the tank farm facilities, persons in charge and shift superintendents are given periodic training in procedural changes.

The lessons learned coordinator at SRR screens incidents, accidents, and near-misses at SRS and the rest of the DOE complex. The lessons learned are disseminated to employees online and are part of required reading. In required reading, the employees are required to self-certify that they have read and understood the contents.

Managers also receive the safety and health training provided to the employees and supervisors. Additionally, they attend courses and seminars designed to enhance their safety, health, and leadership skills. Managers are encouraged to attend various conferences and workshops, such as those sponsored by the American Society of Safety Engineers. Managers are also actively benchmarking other facilities within the DOE complex to enhance their knowledge, skills, and abilities.

SRR has an effective process to identify specific training requirements for each employee. Each job function has a Training Program Description (TPD). The TPD takes into account the potential job hazards the employee might face. Managers and training coordinators use the TPD for each new or reassigned employee to identify the employee's training needs. The training needs are entered into the Automated Qualification Matrix (AQM), a database maintained by SRNS. The training coordinators schedule the training and notify the employees and their managers. Once the training is completed, AQM maintains a list of all employees who have completed the training for a specific job function and are qualified to perform the job.

Training records are easily accessible by employees, their supervisors, and managers. SRR training records are maintained in the Training Record Automated Information Network (TRAIN) maintained by SRNS. TRAIN is the master system for SRS through which employee records are managed. Training records reviewed by the Team demonstrated that the training records were complete with only two cases where the training had expired. Employees indicated they were satisfied with the quality and ease of use of TRAIN.

Each major facility at SRR has a training lead that monitors the training records of employees. Using TRAIN, the training leads prepare a query of employees whose training would expire within 90 days, 60 days, and 30 days. Additionally, TRAIN also notifies the employees and their managers via e-mail 60 days in advance of any expiration. The training leads send several reminders to the employees and their managers by e-mail in advance of the expiration of employee training. In the event an employee is out on disability or extended leave, the training leads reschedule the training and update the training records. However, an employee with

expired training cannot be assigned a task related to the expired training as specified in those workers' TPD and AQM. For example, qualifications had expired for the two employees discussed in the previous paragraphs because they had failed to recertify their Area Emergency Operator CBT. One was a shift manager and the other an operator at F-Tank Farm. As a result of their expired qualifications, they were not assigned the responsibility to stand watch independently as shift manager and tank operator. Subsequently, they completed the CBT and their qualifications were updated and the restrictions placed on those workers were lifted. Finally, the badges of employees whose CAT training is expired are suspended and the employees are denied entry to SRS until they have completed CAT.

A noteworthy training program employed by SRR during 2010 is the MoveSMART program. MoveSMART uses a reinforcement-based process for reducing soft tissue and hand injuries, sprains, slips, trips, and falls. SRR obtained the license for this commercial program and trained instructors who, in turn, trained the workforce. Over 2,000 SRR employees have been trained. Since implementing the MoveSMART program, SRR has achieved a 67 percent reduction for these types of injuries from 2009 to 2010.

Another good practice noted by the Team was SRR's use of multi-trained craft allowing workers to cross-train between different areas. For example, RCIs were cross-trained as IH technicians, and HTF operators were trained on FTF operations. This practice gives SRR more flexibility to deal with changing workforce requirements in various facilities and craft.

The Team observed portions of the ETP Initial Basin Operators training, the New Hire training for SPDF, the DWPF Pipeline Common Core System training, and the FTF Waste on Wheels Overview to cross-train HTF operators on FTF. A common theme of all these training sessions was that the classroom training is supplemented by frequent field visits to better understand the operation of the facilities. The technical content was appropriate; the instructors were highly experienced and the attendees, including the new hires, participated actively in all of the classes.

Conclusion

SRR has a well-established training and qualification program that ensures employees are appropriately trained to recognize hazards and to protect themselves and coworkers. The SRR training program helps managers, supervisors, and employees to understand the established safety and health policies, rules, and procedures to promote safe work practices and minimize exposure to hazards. SRR meets the requirements of the Safety and Health Training tenet of DOE-VPP.

VIII. CONCLUSIONS

Statistically, SRR clearly meets the expectations for continued participation in DOE-VPP at the Star level. A slight upward trend in recordable cases in the construction areas was evident and seems to be primarily attributable to personnel brought in through ARRA. SRR has been working effectively to fully integrate these workers into the SRR safety culture. Overall, illness/injury rates remain a small fraction of the comparison industry rates.

Within each of the five tenets of DOE-VPP, SRR is demonstrating effective cooperation between managers and employees, with a clear dedication to effective ISM. Managers and workers are clearly proud of their safety performance and have developed an uncompromising attitude of accomplishing their mission safely. SRR will undoubtedly realize significant future benefits in expanding efforts to coach and mentor workers in applying HPI and conduct of operations principles in every aspect of their work to ensure policies, processes, and procedures capture the knowledge and experience of the workers.

Worksite Analysis and Hazard Prevention Control require effective cooperation with SRNS to ensure previously identified weaknesses are adequately addressed. These improvements will also contribute to making a working system more effective and efficient. Effective use of elimination, substitution, or engineered controls rather than relying solely on PPE was evident to the Team. Training and qualification programs for operators were rigorous, challenging, and ensure that employees are appropriately trained to recognize hazards and to protect themselves and coworkers.

Based on these observations, the Team believes that SRR has adequately completed the transition from the previous contract and is fully deserving of recognition in DOE-VPP; the Team recommends that SRR continue to participate at the Star level.

Appendix A: Onsite VPP Assessment Team Roster

Management

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