URS | CH2M OAK RIDGE LLC

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
April 14-23, 2015

U.S. Department of Energy
Office of Environment, 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 Environment, Health, Safety and Security (AU) is responsible for managing DOE-VPP. AU intends to expand contractor participation complex-wide and coordinate DOE-VPP efforts with other Department functions and initiatives, especially Integrated Safety Management (ISM).

DOE-VPP focuses on areas where DOE contractors and subcontractors, using ISM, 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, including production facilities, laboratories, subcontractors, and support organizations.

DOE contractors are not required to participate in DOE-VPP. In keeping with OSHA and DOE-VPP philosophy, *participation is strictly voluntary*. Additionally, participants may withdraw from the program at any time. DOE-VPP consists of three programs with designations 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 stepping-stone for participants that have good safety and health programs, but need time and DOE guidance to achieve true Star status. The Demonstration program, used rarely by the Department, allows DOE to obtain additional information 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 to participate in DOE-VPP, DOE recognizes that the applicant exceeds the basic requirements for systematic protection of employees at the site. As the symbols of such recognition, DOE provides certificates of approval and the right to use DOE-VPP flags for the program in which the site is participating. The participants may also choose to use the DOE-VPP logo on its letterheads and/or on award items for employee incentive programs.

This report summarizes the results from the evaluation of URS | CH2M Oak Ridge LLC (UCOR) at the East Tennessee Technology Park, Tennessee, during the period of April 14-23, 2015, and provides the Associate Under Secretary for Environment, Health, Safety and Security with the necessary information to make the final decision regarding UCOR's participation in DOE-VPP. The Team is recommending that DOE admit UCOR to DOE-VPP at the Star Level.

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ABBREVIATIONS AND ACRONYMS

AU	Office of Environment, Health, Safety and Security
AU-12	Office of Worker Safety and Health Assistance
BBS	Behavior-Based Safety
BLS	Bureau of Labor Statistics
CBT	Computer-Based Training
CFR	Code of Federal Regulations
D&D	Decontamination and Demolition
DART	Days Away, Restricted or Transferred
DISC	Dominance, Influence, Steadiness and Compliance
DOE	Department of Energy
EA	Office of Enterprise Assessments
EAL	Emergency Action Level
ECP	Employee Concerns Program
EMWMF	Environmental Management Waste Management Facility
ES&H	Environment, Safety and Health
ETTP	East Tennessee Technology Park
FA	First-Aid
IH	Industrial Hygiene
IHAS	Industrial Hygiene Analytical System
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
IWCP	Integrated Work Control Program
JHA	Job Hazards Analysis
LEARN	Local Education Administrative Requirements Network
LGWO	Liquid and Gas Waste Operation
LSIT	Local Safety Improvement Team
NAICS	North American Industry Classification System
NRRPT	National Registry for Radiation Protection Technologists
OJT	On-the-Job Training
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
PAF	Position Assignment Form
PAPR	Powered Air-Purifying Respirator
POD	Plan-of-the-Day
PPE	Personal Protective Equipment
PSAP	Personal Safety Action Plan
QARP	Questioning Attitude Recognition Program
RPP	Radiation Protection Program
SME	Subject Matter Expert
STARRT	Safety Task Analysis Risk Reduction Talk
STS	Safety-Trained Supervisor
SWIFT	Safe Work Initiative for Teams
Team	Office of Environment, Health, Safety and Security DOE-VPP Team
TPD	Training Position Description
TPOC	Training Point-of-Contact
TRC	Total Recordable Case
UCOR	URS | CH2M Hill Oak Ridge LLC

USQD	Unreviewed Safety Question Determination
USW	United Steel Workers
VPP	Voluntary Protection Program
VSDS	Visual Survey Data System

EXECUTIVE SUMMARY

URS | CH2M Hill Oak Ridge LLC (UCOR) is a partnership between URS (now AECOM) and CH2M Hill Constructors contracted to clean up areas within the Department of Energy (DOE) Oak Ridge Reservation, primarily the East Tennessee Technology Park. These areas include former uranium enrichment facilities for commercial nuclear power and defense programs, research and development activities, and environmental cleanup missions. UCOR also provides soil and groundwater remediation, landfill design and construction, operation of waste facilities, infrastructure support, and support services. UCOR provides technical services and site support that include surveillance and maintenance, engineering, and operations of smaller facilities. United Steel Workers Local 9-288, the Atomic Trades and Labor Council (ATLC), and the Knoxville Building and Construction Trades Council (KBCTC) collectively represent about 370 UCOR employees.

UCOR submitted its Voluntary Protection Program (VPP) application per the DOE-VPP application guidelines to the Office of Worker Safety and Health Assistance (AU-12), within the Office of Environment, Health, Safety and Security (AU), in April 2014. AU-12 reviewed and accepted the application and worked with UCOR to schedule an onsite assessment.

UCOR injury and illness statistics are significantly lower than its comparison industry. The AU DOE-VPP Team's (Team) review of accident and injury logs did not identify any significant issues or problems with categorization and classification of injuries. The Team did not find any disincentives to reporting injuries.

UCOR has established an experienced and knowledgeable management team that uses safety to achieve effective contract performance. It has invested the necessary time and resources to establish trust and respect within the workforce. Managers are visible and accessible in the workspaces, and their dedication to support the workforce as a means of achieving contract success is paying huge dividends on the cost and schedule.

UCOR encourages and supports employee involvement in safety forums, workgroups, and campaigns to improve the safety culture within the company. UCOR recognizes employees in newsletters and other means for contributing to a safe work environment. Workers receive rewards through drawings upon submission of ideas or improvements. Workers have no fear of reprisal for pausing work for clarification or a safety concern. UCOR actively encourages workers to pause and have a questioning attitude.

UCOR has an effective work control program to define the scope of work, to analyze the hazards, and to recommend appropriate controls. UCOR uses the many sources of information about processes that exist within facilities to define a workscope, and uses workers' experience in the planning process to analyze the hazards and implement controls. The environment, safety and health organization is actively involved in gathering data to define work hazards and implement controls for activities.

UCOR employs the hierarchy of controls to eliminate or mitigate hazards to the workforce. The UCOR wellness program, in conjunction with the medical provider, effectively engages employees to seek out ways to improve their health. UCOR also counsels employees about health or job-related concerns that employees may have. The radiological control program follows the requirements set forth in title 10, Code of Federal Regulations (CFR), part 835, *Occupational Radiation Protection* (10 CFR 835). UCOR supports certification of technicians

by funding study sessions and testing fees. UCOR's emergency management organization is actively trying to meet its obligations under the DOE Orders, and seeking additional staff to support that effort.

UCOR provides training to workers to ensure they are proficient in their jobs and recognize hazards of different work areas. The majority of training occurs in classrooms and requires demonstration of skills on mockups and tests. UCOR has an effective program to verify that workers meet training requirements prior to performing work. UCOR managers recognized the need to improve training for supervisors and recently purchased a new software package to help train them in communication, active listening, and other soft skills.

From the first day of its contract, UCOR has established a strong working partnership between the company and its workforce. Safety on the jobsite has been an all-encompassing value for managers and workers alike. Commitment to safety, experience at other DOE sites, and local knowledge of the site history has created a strong culture of effective contract performance. UCOR continues to establish effective policies, processes, and procedures that provide workers with the tools and guidance they need to perform their job safely. UCOR effectively minimizes schedule pressure, both real and perceived, and encourages workers to take the time necessary to understand the work, control the hazards, and not accept risks without appropriate approvals. In all respects, UCOR demonstrates the performance expected of a DOE-VPP site. The Team recommends that DOE admit UCOR to DOE-VPP as a Star participant.

TABLE 1

OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
UCOR should consider forming a voluntary communications committee to ensure company communications effectively reach workers.	**5**
UCOR should consider including the work planning and control process as one of the first system reviews to ensure the system is ready for the additional work-planning load.	**5**
UCOR should ensure communication of issue resolution and periodic updates to employees.	**8**
UCOR should consider implementing a systemic process that rewards and recognizes employees for cost-saving suggestions.	**9**
The QARP committee should develop and implement comprehensive and consistent criteria for selection of the QARP winner.	**10**
To foster greater employee participation, UCOR should effectively document and trend wellness statistics, use those statistics as leading indicators, and share that data with the workforce.	**11**
UCOR should consider including actual air sampling results and glove selection references in the JHA to strengthen the conclusion of the control selected.	**14**
UCOR should consider including the corrective maintenance backlog as part of its monthly ISM performance metrics.	**16**

I. INTRODUCTION

URS | CH2M Hill Oak Ridge LLC (UCOR) is a partnership between URS (now AECOM) and CH2M Hill Constructors contracted to clean up areas within the Department of Energy (DOE) Oak Ridge Reservation, primarily the East Tennessee Technology Park (ETTP). These areas include former uranium enrichment facilities for commercial nuclear power and defense programs, research and development activities, and environmental cleanup missions. The facilities, originally part of ETTP, included the original Oak Ridge Gaseous Diffusion Plant (K-25) and the Toxic Substances Control Act Incinerator. Many of these facilities have been demolished, and several of the cleaned facilities now belong to the Community Reuse Organization of East Tennessee (CROET) for reindustrialization. UCOR also conducts surveillance and maintenance activities and operates the Reservation's primary waste disposal cell. UCOR employs approximately 1,400 people, with approximately half of those being subcontractors. The contract is a cost-plus-award fee contract with performance-based incentives for the completion of the decontamination and demolition (D&D) and environmental remediation work that started in August 2011 and runs 5 years through 2016, with four option years. The current annual budget is $329 million.

UCOR is engaged in D&D, soil and groundwater remediation, landfill design and construction, operation of waste facilities, infrastructure support, and support services. UCOR provides technical services and site support that includes surveillance and maintenance, engineering, and operations of smaller facilities. Support services include project planning; integration and controls; business management; and environment, safety, health, and quality assurance.

Three separate bargaining agreements covering nine separate unions represent workers under the UCOR contract, and each of them provided written letters of commitment with the application. United Steel Workers (USW) Local Number 9-288, the Atomic Trades and Labor Council (ATLC), and the Knoxville Building and Construction Trades Council (KBCTC) collectively represent about 370 UCOR employees. Each of these unions endorsed the UCOR application and partnership to keep workers safe.

UCOR submitted its Voluntary Protection Program (VPP) application per the DOE-VPP application guidelines to the Office of Worker Safety and Health Assistance (AU-12), within the Office of Environment, Health, Safety and Security (AU), in April 2014. AU-12 reviewed and accepted the application and worked with UCOR to schedule an onsite assessment. The AU DOE-VPP Team (Team), which included personnel from AU-12 and other subject matter experts (SME) from the DOE complex, conducted an onsite assessment to make a recommendation to the Associate Under Secretary for Environment, Health, Safety and Security regarding UCOR's participation in DOE-VPP. This document provides the results of that onsite assessment, and the Team's recommendation.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Table 2.1 Injury Incidence/Lost Workdays Case Rate (UCOR)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Rate	Days Away, Restricted, or Transferred (DART) Cases	DART Case Rate
2012	2,157,836	9	0.83	5	0.46
2013	2,240,813	10	0.89	7	0.62
2014	2,237,020	11	0.98	5	0.45
3-Year Total	6,635,669	30	0.90	17	0.51
Bureau of Labor Statistics (BLS-2013) average for NAICS * Code 56291, remediation services.			2.7		1.6

Table 2.2 Injury Incidence/Lost Workdays Case Rate (Subcontractor)					
Calendar Year	Hours Worked	TRC	TRC Rate	DART Cases	DART Case Rate
2012	535,498	1	0.37	0	0
2013	253,944	2	1.58	2	1.58
2014	274,042	1	0.73	0	0
3-Year Total	1,063,484	4	0.75	2	0.38
Bureau of Labor Statistics (BLS 2013) average for NAICS * Code # 56291, remediation services.			2.7		1.6

*North American Industry Classification System

TRC Incidence Rates, including subcontractors: 0.88
DART Rates, including subcontractors: 0.49

Conclusion

UCOR injury and illness statistics are significantly lower than its comparison industry. There were two recordable cases, one of which involved lost time or work restrictions for 2015 at the time of this assessment. The number of First-Aid (FA) cases has remained steady for the past 3 years. The Team's review of accident and injury logs did not identify any significant issues or problems with categorization and classification of injuries. Many of the cases are slips, trips, and falls, and UCOR is working to reduce or eliminate those injuries, but UCOR workers encounter other hazardous conditions during the D&D phases. For example, workers have fallen over electrical cords on cramped and deteriorating working surfaces. Continued emphasis on the changing work environment with improved worker situational awareness may help to identify the hazards of the work location. The Team did not find any disincentives to reporting injuries. The UCOR injury incidence rates meet the expectations for DOE-VPP participation.

III. MANAGEMENT LEADERSHIP

Management leadership is a key element of obtaining and sustaining an effective safety culture and implementing the guiding principles of Integrated Safety Management System (ISMS). The contractor must demonstrate senior-level management commitment to ISMS and occupational safety and health, in general, and to meeting the expectations of DOE-VPP. Management systems for comprehensive planning must address health and safety requirements and initiatives. 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.

UCOR has established a very knowledgeable and experienced team of managers, who incorporate experience and lessons learned from many high hazard D&D sites. The sites include commercial reactors, Rocky Flats, the Idaho Cleanup Project, West Valley, the Separations Process Research Unit, Hanford, Sellafield, and Defense Demilitarization sites. This experience gives the management team the knowledge and ability to anticipate potential issues before problems occur, and quickly identify and approve remedial actions. The management team understands the dynamic relationships between stakeholders, regulators, workers, and the company, and works to keep all these groups informed and involved in decisions affecting the cleanup.

UCOR managers believe that the workforce is its most important asset, and base UCOR's success on effective relationships with the workforce and labor. One manager identified UCOR's management style as "built on humanity, clarity, and courage." It considered the effect on the workforce of every corporate decision, and implemented this approach from its first day. All managers interviewed by the Team understood their purpose was to ensure they took care of the workers. UCOR senior managers hold the relationship with the bargaining units in very high regard. The senior managers collaborate with all three labor organizations in regular meetings and walkdowns to ensure workers' knowledge, skills, and abilities are used to the fullest extent practical, and achieve efficient, effective performance. UCOR's concern for labor relations was evident by the decision to shut down activities at the site for 5 days due to snow and ice. Normally, UCOR would not have paid personnel in the bargaining units for those days but did to prevent hardships. In another case, after completing the demolition of the K-25 building early and under budget, UCOR received a significant contract award fee, which it shared through bonuses to the entire workforce, including union workers. To further help workers, UCOR modifies the regular 4-10 work schedule (normally Monday through Thursday) when Monday holidays occur. Construction workers do not receive Holiday pay, so UCOR allows workers to work the Friday before the Monday holiday in order to prevent reducing their paychecks due to Federal holidays.

UCOR's commitment to protect and support the workforce has been very evident as it pursues greater efficiency in its operations. UCOR recently reduced the number of managers in the organization without reducing the number of bargaining unit workers. The workforce has been very appreciative of UCOR's efforts to stabilize the workforce, avoid layoffs of personnel, and

work with DOE to direct cost underruns into additional workscope that keeps the workforce employed.

Stewards and safety advocates meet monthly with the labor relations manager and senior management team in an open forum to discuss issues and concerns. The Team attended and observed a monthly meeting, where attendance was near full capacity for the room. The managers created an open atmosphere that promoted conversations about issues. The stewards and safety advocates demonstrated their willingness to raise questions, listen to answers, and propose solutions. Managers were attentive to issues, provided feedback on issues raised the previous month, and encouraged the labor leaders to raise issues.

UCOR expects all managers, including those with primarily administrative or support staff functions, to be frequently present and visible in the workspaces and to perform at least one management field observation every month. This approach promotes managers' awareness of how their function supports the work and gives workers an opportunity to interact with managers they might never see otherwise. These managers sometimes bring a fresh perspective to hazards at the worksite that have blended into the background from workers' perspective. During these site visits, managers are leading by example, demonstrating safe behaviors, and providing pertinent safety observations. This contributes to a mutual respect and trust between workers and managers. All managers interviewed expressed their commitment to visiting a variety of worksites.

UCOR listens and is eager to address worker issues and questions, and is working to put workers at ease. Early during contract transition, managers, including the company president, conducted roundtables and all-hands meetings where they asked workers to identify issues. In one project meeting, the D&D manager passed out sticky notes to workers so they could write their issues or questions. Workers were sitting at tables in groups of six to eight people, and he expected each group would identify one or two issues, but instead received over 400 individual issues. After the meeting, he reviewed each sticky note, grouped the notes by similar issues into bins, and determined the importance of the issues by the number of workers with similar issues. This approach allowed the D&D manager to address the most important issues quickly and gained tremendous respect among the workforce. UCOR maintains an active Employee Concerns Program (ECP) that has addressed an average of seven concerns per quarter. The Team reviewed categories of concerns, with few rising to a level that indicated a significant problem. The number of concerns has dropped since 2012. Based on interviews with workers, the Team attributes that drop to a growing sense among workers that managers and supervisors will address any issue that they raise.

UCOR has extensive communications efforts that include a variety of safety-focused publications, TV monitors around the site with visual safety messages, Web pages, plans-of-the-day (POD), reports, etc. Despite these efforts, a recent safety culture survey indicated that UCOR did not always inform workers about actions or solutions that addressed their concerns. Although UCOR has an extensive communications program, it has a limited number of staff. In order to help it address the issues raised by the safety culture survey, UCOR might consider forming a communications committee, such as the employee environment team used by Savannah River Remediation, LLC (another AECOM-affiliated company) at the Savannah River Site. This committee could help the communications staff monitor the effectiveness of

communications, raise communication issues and observations from the workers' perspective, and help UCOR effectively focus its communication efforts.

Opportunity for Improvement: UCOR should consider forming a voluntary communications committee to ensure company communications effectively reach workers.

UCOR excels in providing resources to encourage and promote safety. In addition to the time commitment for employees to attend safety meetings, UCOR funds a variety of promotional activities and safety campaigns. UCOR shares expenses from corporate funds to provide food at safety events, sends workers to safety conferences, promotes the Safety-Trained Supervisor (STS) process, and has reward and recognition programs.

Safety is the foundation for long-term success of UCOR. Strategic project plans factor in safety in estimates, including necessary equipment, maintenance, and personnel training and qualifications. UCOR has worked with the other contractors on the Oak Ridge Reservation to identify enterprise risks and maintain an enterprise wide risk register. That risk register identifies multiple risks, including financial, safety, environment, or security that might affect one or more contractors. One key result from that effort identified a significant, but unrecognized, risk to the Oak Ridge National Laboratory (ORNL) mission for which UCOR was responsible. In addition to the D&D mission, UCOR operates the environmental management component for both Y-12 National Security Complex and ORNL. As such, UCOR operates the Liquid and Gas Waste Operation (LGWO) facility that treats effluents. LGWO treats water from several facilities at ORNL before releasing the water to the environment. The review revealed that approximately $500 million in revenue at ORNL could be at risk if the LGWO facility had to shut down for an extended period, but the facility was one of the lowest funded projects for UCOR. UCOR is working with DOE and the other contractors to ensure it appropriately funds LGWO operation and maintenance, and to realign contract performance measures with the Integrated Priorities List from the risk register.

UCOR has a mature and effective system of policies, procedures, and processes to perform work safely and efficiently. Its work planning and control system represents the culmination of many years of experience at multiple DOE sites (see Worksite Analysis). UCOR plans to initiate reviews, beginning with its administrative processes, to improve the efficiency of those-processes without sacrificing compliance or performance. As UCOR moves from repetitive work of demolishing large buildings containing the enrichment cascade into more unique facilities as part of the Poplar Creek D&D, the number of uniquely planned jobs will increase significantly. UCOR should consider including the work planning and control process as one of the first system reviews to ensure the systems are ready for the additional work-planning load.

Opportunity for Improvement: UCOR should consider including the work planning and control process as one of the first system reviews to ensure the systems are ready for the additional work-planning load.

UCOR is committed to doing work safely, or not doing it. All managers believe stop work is a good indicator that workers are asking questions, challenging the status quo, and working safely. UCOR recognizes that schedule pressures exist, and is working continuously to help workers not

succumb to schedule pressures, or create additional ones. It has already proven to workers the value of working steadily, and not trying to rush to meet deadlines by completing the K-25 demolition well ahead of schedule and at significant cost savings.

In response to the safety culture survey mentioned earlier, UCOR developed and implemented a Sustainability Plan for Safety Culture. The plan included creating a Safety Culture Monitoring Panel, improving recognition programs, performing a common cause analysis of injuries and corrective action plans, performance assurance improvements, benchmarking and assist visits from corporate parents, implementing human performance improvement, and increasing the number of Local Safety Improvement Teams (LSIT). UCOR is closely monitoring each of these efforts, developing leading indicators that will measure improvements, and help UCOR identify and correct safety culture issues before problems arise. UCOR considers these initiatives critical to helping avoid the complacency that can arise from long-term safety success.

Although UCOR work employs approximately 1,400 people, nearly half of those workers are subcontractor personnel. UCOR subcontractors include staff augmentation workers that receive their daily, and task-specific work assignments directly from UCOR. UCOR self-identified that its subcontract management primarily focused on the subcontractor coordinator, whose only task was to review invoices from the subcontractors. As an improvement, UCOR is implementing a Subcontract Technical Representative program that it adopted from the Idaho Cleanup contractor, to provide more technical direction and oversight to subcontractors, and ensure subcontractor safety and health. Subcontractors are often working close by, or even side-by-side with other UCOR workers. Because the subcontractors are so well integrated into the workforce, in many cases, the Team had difficulty discerning between UCOR and subcontractor personnel.

Conclusion

UCOR has established an experienced and knowledgeable management team that is fully committed to effective contract performance through safety. It has invested the necessary time and resources to establish trust and respect with the workforce. Managers are visible and accessible in the workspaces, and their dedication to supporting the workforce as a means of achieving contract success is paying huge dividends on the cost and schedule performance. UCOR effectively demonstrates the Management Leadership expected of a DOE-VPP 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.

Employees have numerous opportunities to become engaged through programs and activities offered by the company. Examples include: LSITs, Behavior-Based Safety (BBS) observation cards (Safety Starts With Me), I Care We Care, Good Catch, Questioning Attitude Recognition Program, safety meetings, the rest of the story (TROTS), safety training (such as job-specific, BBS, VPP, STS), the Monthly Observation Checklist for Senior Managers, and numerous safety and health activities offered through the Wellness Committee. The Board of Certified Safety Professionals certifies the STS, and UCOR pays the associated fees for its employees that seek that certification. Sign-in rosters track safety meeting attendance with a goal of 80 percent attendance at each meeting. The March meeting attendance was at 97 percent with a 6-month average of 89 percent. Other programs and committees in place to promote the safety of employees include the As Low as Reasonably Achievable (ALARA) Committee, Steward and Safety Advocate Meetings, the Electrical Safety Committee, ISMS, and the President's Accident Prevention Council (PAPC).

Interviews and meetings demonstrated that Employee Involvement is a key element of UCOR’s safety and health programs. Interviewed employees trust their managers and believe "safety is first" in the planning and execution of work. Employees are engaged in developing and implementing a safety conscious workforce by identifying issues, offering suggestions, and participating in safety teams. UCOR encourages employees to stop/pause work, have a questioning attitude towards safety, and identify possible improvements.

During the past year, UCOR formed seven LSITs (two for administrative areas and five in the field for crafts) and they have been meeting monthly for about 6 months. Each LSIT has a management sponsor, a chairperson, and a written charter that describes their objective, roles and responsibilities, and operating guidelines. Volunteers make up the bulk of the LSIT committee, and they meet at least monthly to review safety observation data, share information, and track progress on safety action items. LSIT members distribute information to managers and employees through LSIT minutes, safety meetings, POD meetings, and other group interactions. Some LSITs have created Web sites and the rest are under development. Web sites convey meeting minutes, statistics, and other information immediately to all employees. Some teams function more effectively than others do due to the experience and knowledge of team members. Those teams had "participative" interactions, structured meeting agendas, and performed detailed review and trending of safety statistics and action items.

Per the basic charter for LSITs, the review, analysis, and tracking of BBS observation data is required for all LSITs. The Team attended the Safe Work Initiative for Teams (SWIFT) LSIT chaired by the craft safety advocate. Attendees reviewed the 2014 calendar year BBS card submittals. UCOR uses BBS cards to proactively prevent injuries and illnesses by identifying and correcting at-risk-behaviors and work area conditions that could pose a risk to the safety and health of people and/or the environment. Workers observe other workers performing work and communicate both positive and at-risk observations. UCOR received over 900 observations. Thirty one percent of the observations addressed "work environment," and 22 percent addressed body position (bending, twisting, and reaching). To encourage employees to submit BBS observations, each month a drawing occurs from the cards submitted for three $50 gift cards. LSIT meeting minutes, the Safety Advocate newsletter, and other communications recognized the three winners from the BBS card drawing.

The SWIFT LSIT discussion also addressed issues and concerns that were open and those that UCOR had closed since the previous meeting. From the previous month's actions list, 45 items were completed and 15 were in progress. The Team observed that if previous issues remained open, the LSIT chair asks a supervisor to take the action for followup. In another example of LSIT ownership, workers expressed a need to know who their industrial hygiene (IH) support was for each job and what channel on the radio the IH support person monitors. UCOR committed to include that information in POD meetings and Safety Task Analysis Risk Reduction Talk (STARRT) card reviews. STARRT cards are a tool employees use in addition to the UCOR work planning and hazard analysis processes prior to the start of an activity to ensure all hazards are controlled, and they are ready to start work.

During interviews, the Team heard that employee-identified safety issues did not always include a feedback mechanism to the employee. Some employees indicated that they did not receive information on resolution of the issue identified. Therefore, they felt that managers were not as responsive to concerns as they could be. It was determined through the Safety Culture Survey that managers did not get back with employees in a timely manner because they were still working on the issue. UCOR should ensure communication of issue resolution and periodic updates to employees.

Opportunity for Improvement: UCOR should ensure communication of issue resolution and periodic updates to employees.

LSIT members stated that this is the first time in the workers' experience that they are getting issues resolved through a team approach. Employees stated that this effort by UCOR has been very effective. The pride they take in working together as one team (UCOR, craft, and subcontractors) and the respect they have for UCOR was evident through their comments. Employees feel comfortable stopping work and approaching managers with safety issues or concerns. Employees told the Team that every safety meeting begins with (and sometimes ends with) a safety share from someone in the room.

While UCOR receives suggestions in various ways through its safety programs, there is no formal program or process for managing improvement ideas from submission to implementation. UCOR could build upon the safety culture that it is fostering, and strengthen employee

engagement by implementing a systematic employee suggestion program. Such a program to reward process and safety improvement suggestions would encourage additional employee suggestions. The program should include incentives and criteria that support program expectations and effective, safe work execution. A well-run and robust program will provide additional focus on correcting safety issues and provide documented cost savings for the company.

Opportunity for Improvement: UCOR should consider implementing a systemic process that rewards and recognizes employees for cost-saving suggestions.

The Team saw a variety of safety communication tools throughout UCOR. UCOR publishes and distributes several newsletters on a regular basis through the UCOR Web site, such as Safety Advocate, Safety Flash, UCOR Newsline, Tuesday Tool Box, and VPP Notes. Each quarter, employees receive the National Safety Council's magazine "Family Safety and Health." UCOR's monthly Safety Statistics are included in every issue of the Safety Advocate. TV monitors placed throughout UCOR's facilities share safety messages, reminders (such as VPP certification team onsite!) and other employee information. Bulletin boards in the facilities visited were attractive, neat, up to date, addressed safety and employee involvement, and displayed required Federal guidelines. Recently, UCOR initiated a "signage committee" to review and correct contradicting messages on signs posted at locations across the site. An employee, through a BBS observation, recognized the need to correct contradicting signs across the site and submitted the suggestion. UCOR frequently notifies and reminds employees of meetings and events, severe weather warnings, and other pertinent information through Text Blasts. UCOR also sends a variety of safety and health text messages to employees' cell phones through the Wide Area Rapid Notification (WARN) emergency notification system.

UCOR encourages employees to participate and demonstrate their commitment to safety and workplace improvements by developing and displaying a Personal Safety Action Plan (PSAP). These plans identify personal goals for work, home, and health and wellness. Submitted PSAPs are eligible for a chance to win a dinner train ride for two. The latest version of the UCOR safety "Passports" program is the "Ticket to Ride." "Ticket to Ride" booklets have been very successful for VPP awareness. Eleven hundred of the 1,400 employees completed and returned their "passports" in the 60-day window. Part 1 was due by March 5 and part 2 was due on April 2. Four randomly selected winners received a $200 gift card each. Three individuals who completed both parts received a $500 gift card each. UCOR held an appreciation luncheon for everyone who participated in the "Ticket to Ride" campaign.

In March 2014, UCOR initiated the Questioning Attitude Recognition Program (QARP) to encourage employees to question practices or conditions that need improvement. All employees, including subcontractors, are eligible for nomination. Anyone can nominate someone for this recognition through POD meetings; staff meetings; any environment, safety and health (ES&H) staff member; or through a soon to be available online form. All nominees receive their choice of a t-shirt, ball cap, or safety vest. A QARP selection committee meets monthly to select the best practice from that month's submittals, and the winner receives a $50 gift card and recognition through the Safety Advocate and UCOR Newsline. A quarterly winner receives a $100 gift card. This program supports UCOR's safety conscious work environment.

The Team attended the QARP committee meeting and reviewed the QARP criteria for selection of noteworthy nominees. This is a relatively new committee. The criteria for recognition are somewhat ambiguous, and employees are not fully aware of the committee's role. During a QARP committee meeting, committee members had difficulty evaluating the criteria for selection of the winner. While all the submittals were good, better criteria would help the committee to differentiate between good catches and worthy questioning attitude winners. To improve its effectiveness, the committee should develop and implement comprehensive and consistent criteria for selection of the QARP winner.

Opportunity for Improvement: The QARP committee should develop and implement comprehensive and consistent criteria for selection of the QARP winner.

In February 2015, UCOR began a safety culture evaluation that lasted several months, and then published the results on the UCOR Web site. The total employee response rate for the 2015 evaluation was 52.2 percent and indicated that 80 percent of participants worked for their current employer 5 years or less. The report concluded that the UCOR safety culture has a solid foundation with a high degree of personal accountability, firm management support, and a strong questioning attitude. The organization is performing at a high level of safety awareness as UCOR celebrated a significant safety milestone in March. The entire UCOR team (including all supporting labor unions) completed over 3 million safe hours worked without a Days Away case between December 2013 and March 2015.

To address opportunities for improvement identified in the survey and continue to achieve safety excellence, UCOR formed the Safety Culture Monitoring Panel. The panel consists of representatives from every organization and focuses on three areas of the safety culture: Leadership, Employee and Worker Engagement, and Organizational Learning. Fifteen attributes pertaining to these focus areas have been identified. Employee interviews and published documents support these survey results.

The Wellness Committee is dedicated to offering health and safety activities for all employees. Examples of voluntary opportunities include: Earth Day activities (available to all employees); the annual Safety Fair (1,200 attendees in 2014); Work on Wellness (WOW) sessions, which schedules lunch and learn type programs on various topics, such as meal planning 101; and the "Walk Across Tennessee" in 2014 (204 employees participated on 33 teams). The "Walk Across Tennessee" logged a total of 4,000 miles in the first week of the 8-week program. The 2015 "Walk Across Tennessee" program, which is currently in progress, has 156 employees signed up.

Another UCOR wellness activity was the "Santaclaustrophobia Challenge." This was a year-end challenge to the workforce to avoid gaining weight during the holidays. The goal was not to gain over two pounds throughout the holiday season. One hundred and five participants weighed in prior to the holidays and weighed out in January. Instead of gaining weight, the participants lost a total of 431 pounds.

UCOR supported the peanut butter drive for the Second Harvest Food Bank where employees donated 540 jars of peanut butter for children and senior citizens. In 2014, "The Biggest Loser" weight loss program had 167 employees participate on 30 teams. The total weight lost was 1,918

pounds, representing a total weight loss of 5.41percent. "Weigh to Go" is the 2015 weight loss program and is currently underway. UCOR is considering "Bike on Site" for a future activity because the UCOR site is a good location to ride, and offers a safer riding area for family members since it is a low traffic location. "Staycation" activities offer suggestions that allow employees to stay home during their vacation and participate in local attractions that are within driving distance. In addition, UCOR employees support food bank donations, blood drives, the Angel Tree program, United Way, and other charitable activities.

URS (now AECOM) named UCOR as the URS "2013 Healthy Operations of the Year" earning a $1,000 award for the Wellness Committee. AECOM presents the award to a subsidiary company that has demonstrated positive employee health and wellness initiatives during the year. The award represents the commitment that AECOM makes to create a culture of wellness. Previously, UCOR was the Healthy Operation of the Year for the Government and Military Operations business unit, qualifying it to compete for the corporate-wide award. The State of Tennessee recognized UCOR in 2014 as a "Healthier Tennessee Workplace." Based on advertisements and announcements in varied UCOR media, current statistics, and the visible results, the Wellness Committee is well organized, committed to employee health and wellness, and continuing to plan for future events and activities that engage all employees.

UCOR believes that employee engagement is a key to a company's health and overall success. Based on articles found in UCOR newsletters, employees are participating in wellness events and achieving personal successes. To foster greater employee participation, UCOR should effectively document and trend wellness statistics, use those statistics as leading indicators, and share that data with the workforce.

Opportunity for Improvement: To foster greater employee participation, UCOR should effectively document and trend wellness statistics, use those statistics as leading indicators, and share that data with the workforce.

The ECP is another outlet for employees to identify concerns that may adversely affect the quality or safety of UCOR activities. UCOR supports the right and responsibility of each employee to raise concerns regarding health, safety, security, environmental, waste, and management practices without reprisal. The ECP provides an independent avenue for expressing concerns confidentially or anonymously if the employee chooses not to raise the concern with the supervisor or manager. UCOR publishes the hotline number to call and related information on the UCOR home page, bulletin boards, flyers, informational video monitors onsite, and transmits e-mails from the President and Project Manager supporting the ECP. The ECP manager attends monthly LSIT meetings as an observer and is a member of the Safety Culture Monitoring Panel. The ECP manager also conducts monthly observation checklists for senior managers and monitors safety culture traits. The added field presence allows the ECP manager to be more available (approachable) to employees. Employee concerns pertaining to safety have decreased 7 percent since 2011. During 2014, the ECP manager received 42 new concerns; 37 were resolved and closed within 30 days. Only two of these concerns remain open in 2015.

Conclusion

UCOR encourages and supports employee involvement in safety forums, work groups, and campaigns to improve the safety culture within the company. UCOR recognizes employees via newsletters and other media for contributing to a safe work environment. Workers receive rewards through drawings upon submission of ideas or improvements. Workers have no fear of reprisal for pausing work for clarification or a safety concern. UCOR actively encourages workers to pause work and have a questioning attitude. UCOR meets the expectations of Employee Involvement for a DOE-VPP participant.

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. Implementation of the first two core functions of ISMS, defining the scope of work, and identifying and analyzing hazards, form the basis for a systematic approach to identifying and analyzing 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 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.

UCOR uses the *Integrated Work Control Program (IWCP)*, PROC-FS-1001, to plan identified work using a controlled process. The process begins with comparing the identified work to the predefined and analyzed list of 47 work activities in the *Integrated Work Control Program Exempt List Evaluation Document*, UCOR-4421/A1. These activities are exempt from the IWCP since UCOR has analyzed the activities as presenting low hazards and workers' training is sufficient to perform work safely within their craft. Complex work requires the development of a job hazards analysis (JHA). PROC-FS-1001 defines the JHA development process, which includes the categories of major activities, associated hazards, controls, type of control (elimination, engineering, administrative, personal protective equipment (PPE)), and supporting analysis. Planning teams walk down the work area to understand the work environment prior to developing the JHA in a tabletop discussion. If the planning team does not or cannot perform a field walkdown for a particular task, the planner includes hold points for SMEs to evaluate the hazards prior to workers proceeding with the job steps. Workers and SMEs stated they attend work planning meetings and walkdowns. UCOR uses the experiences of workers and SMEs to create effective work control packages that lead to the safe and successful completion of work.

The Team reviewed several JHAs that included clear descriptions of the major activities, along with the associated hazards and controls. The hazard analysis often refers to a UCOR procedure that requires the control, radiological work permits, IH guidance, safety guidance, and the UCOR Safety and Health Handbook (UCOR-4087). The analysis provides for the adequate selection of controls and measures to use to work safely.

In some of the JHAs reviewed, the identified hazards, such as airborne chemicals, required air sampling to validate the need for different or additional controls once the activity begins. For example, work package WP2-12-KD5037, *General Equipment Maintenance for K-25, K-27, K31, K-892, K-892-Y,* identified exposure to "toxic fumes from heated metals" (welding) as a potential hazard. The control category lists contacting IH to conduct air sampling and lists appropriate PPE for welding. IH has taken numerous air samples for welding activities at K-31, but this analysis was not included in the JHA. In addition, the same control category lists nonspecific respiratory protection for the same hazard. In work package WP1-15-KD3155, *Cold and Dark Process Electrical Isolations for Buildings K-131 & K-631,* the potential hazard column lists skin absorption of oil from stained parts and skin irritation from a grout product. The associated control is nitrile gloves, but nitrile gloves are available in several thicknesses. The analysis should cite a reference that provides degradation and permeation of the selected

glove. This would strengthen the conclusion that the glove and its thickness are correct for the protection of the worker. In addition, asbestos air sampling results, another potential hazard, should include the results in the analysis column to conclude the respiratory protection is the appropriate selection. UCOR should consider including actual air sampling results and glove selection references in the JHA to strengthen the conclusion of the control selected.

Opportunity for Improvement: UCOR should consider including actual air sampling results and glove selection references in the JHA to strengthen the conclusion of the control selected.

UCOR uses a graded approach for work type categories. Type 1, Type 2, and technical procedures must have a specific JHA with the work control package. A Type 1 work package is a single use package that requires step-by-step work instructions for workers to complete the work correctly and safely. Type 2 work packages may be single or multiple use, but step-by-step work instructions are not necessary although information can be given to the worker to perform the activity. Types 1 and 2 include an unreviewed safety question determination (USQD) to determine whether the work is adequately covered by the approved documented safety analysis. Technical procedures are multiple-use documents for work that require step-by-step instructions. Standard practice procedures are multiple-use procedures that may contain step-by-step instructions, but the work is low risk and does not exceed established thresholds requiring another JHA. Similarly, Type 3 work tasks are low hazard with mitigations addressed in UCOR general health and safety documents training and/or job specific training. Preventive maintenance may use Type 2 work packages or technical procedures. Finally, UCOR identified IWCP exempt work as previously analyzed tasks, and those tasks are basic functions applicable to the UCOR work environment. The hazards associated with those tasks are categorized as minor, low risk and are addressed in general health and safety documents and training. Form-2313, *UCOR Exempt List,* identifies those activities, and UCOR-4421, *Integrated Work Control Program Exempt List Evaluation,* documents the analysis supporting those decisions. A facility manager initially evaluates all work activities using a prescribed set of criteria. If the facility manager determines the work is exempt or Type 3, no additional planning is required. If the work exceeds the Type 3 thresholds, the activity returns to work planners for work control development.

UCOR establishes integrated safety management (ISM) in procedure *Integrated Safety Management System (ISMS)*, PPD-EH-1400, dated May 14, 2014. It also incorporates the environmental management system within ISMS to promote the protection of the environment. DOE completed the phase I and II ISMS verification review on March 13, 2013, and an annual review on April 25, 2014.

Industrial hygienists conduct baseline hazards surveys for UCOR and store the data in the industrial hygiene analytical system (IHAS). IHAS was one module of a larger occupational health information system developed at Oak Ridge under another contractor. IHAS dates to approximately 1996 and contains earlier IH data entered after IHAS became available.

Radiological survey and airborne sampling data are stored in the visual survey data system (VSDS). It has been in use at UCOR since 2014. VSDS is searchable via a variety of

descriptive information, such as location, data range, instrument used, or other items. UCOR and previous contractors used several other databases at the site. That data remains accessible to UCOR.

In the past year, ES&H developed building binders containing baseline exposure data and other company proprietary information. For instance, the K-27 building binder contains facility photos, current condition of the building, building characterization reports containing information about asbestos, poly-chlorinated biphenyls (PCB), coolants, lube oils, and chemical trap adsorbents (sodium fluoride and alumina adsorbent). Other reports include information about isotopes, historical hazard surveys from prior contractors, fire hazards, waste handling plans for process equipment and piping, and radiological survey data from various process equipment and areas within the facility. Baseline IH data in the binder includes bulk and air sampling and noise measurements. Other supporting historical documents provide the analysis for the D&D of the building. The binder is useful for identifying and analyzing hazards included in the JHA or other work planning documents for K-27.

Inspections of construction sites are required to ensure the safety of the site since the site is constantly evolving during the D&D of facilities. Occupational Safety and Health Administration's (OSHA) title 29, Code of Federal Regulations (CFR), part 1926.20(b)(2), *Safety and Health Regulations for Construction,* states that such programs shall provide for the frequent and regular inspections of the job sites, material, and equipment to be made by competent persons designated by the employers. DOE-VPP documents refine those requirements into an expectation that the participant will inspect construction worksites weekly, such that it inspects the entire site monthly. UCOR does not document weekly site inspections, but performs daily or more frequent review of the hazardous operations. For instance, at K-31, spotters constantly monitor the D&D work in the radiological zone. Managers, foremen, and workers constantly walkdown the area around the work zone and are constantly observing the site for potential safety issues. Supervisors or the LSIT receive information about unsafe conditions. Workers commented that issues are usually resolved within days. Although UCOR is not documenting a formal inspection of the construction site, it does monitor the construction site daily and documents issues effectively.

Accident investigations follow the format established in *Accident/Incident Reporting,* PROC-EH-2001. An ES&H manager assigns a trained investigator to the case and the investigator uses Form 411, *Accident/Incident Report,* to obtain pertinent data. UCOR also offers accident investigation training to employees to educate employees on the accident investigation process, as well as provide techniques they can use when participating on investigation teams. UCOR investigates and trends all injury, illness, and FA cases as part of the ISM program. Additionally, the ES&H office began a screening meeting to review issues reported from various assessments that are tracked in the corrective action management system. The meeting validates the issue owner and the significance of the issue. The team also reviews the progress of resolving the issue. UCOR has an effective accident investigation system, and the screening meeting ensures the completion of the needed actions.

UCOR, in cooperation with DOE, trends 14 leading and14 lagging indicators for the ISM program. For example, metrics include the number of technical safety requirement violations, monthly safety meeting attendance, number of training delinquencies, and the number of

preventive maintenance activities performed and completed. Although UCOR tracks preventive maintenance, it does not track corrective maintenance backlog. UCOR should consider including the corrective maintenance backlog as part of its monthly ISM performance metrics. Overall, there are no indications of poor performance for the 28 tracked indicators.

Opportunity for Improvement: UCOR should consider including the corrective maintenance backlog as part of its monthly ISM performance metrics.

Conclusion

UCOR has an effective work control program to define the scope of work, to analyze the hazards, and to recommend appropriate controls. UCOR uses many sources of information about processes that existed within facilities to define a workscope, and uses workers in the planning process to analyze the hazards and implement controls. ES&H is actively involved in gathering data to define work hazards and implement controls for activities. UCOR meets the expectations for Worksite Analysis for participation in DOE-VPP.

VI. HAZARD PREVENTION AND CONTROL

The second and third core functions of ISMS, identify and implement controls, and perform work in accordance with controls, ensure that once hazards have been identified and analyzed, they are eliminated (by substitution or changing work methods) or addressed by the implementation of effective controls (engineered controls, administrative controls, or PPE). Equipment maintenance processes to ensure compliance with requirements and emergency preparedness must also be implemented where necessary. Safety rules and work procedures must be developed, communicated, and understood by supervisors and employees. These rules and procedures must also be followed by all in the workplace to prevent, control the frequency of, and reduce the severity of mishaps.

UCOR appropriately controls hazards by using a hierarchy of controls though PROC-FS-1001. The work control procedure states, "The IWCP is applicable to all work activities managed and performed by UCOR and is flowed down to subcontractors in accordance with subcontract terms and conditions as a mandatory contractor procedure." Embedded within the IWCP is a requirement to perform a JHA that leads to the selection of controls. Implementation of these controls is an expectation during the performance of all work.

UCOR provided the Team with many examples where UCOR eliminated hazards, substituted less hazardous processes, engineered controls, used administrative controls, and as a last resort identified PPE when engineered or administrative controls were not practical. Many of these examples were suggestions from employees or lessons learned in the D&D of ETTP buildings or from other DOE sites.

UCOR eliminated many identified hazards. For example, prior to conducting activities to remove process equipment, UCOR made the buildings "cold and dark." This process removes all sources of hazardous energy (electrical, compressed air, water) coming into the building by disconnecting the entry point and creating an "air gap." UCOR then installs controlled temporary electrical power or other utilities as necessary. UCOR eliminated criticality accident scenarios for vehicle accidents by closing roads to traffic. It eliminated fall from heights by removing components from buildings and disassembling them outside on the ground. It eliminated risks of size-reducing building fans by moving the fans outside. As an improvement, UCOR has begun partially cutting pipes (tabbing) so the piping can be removed later by machines rather than having pipefitters rigging supports to segment pipes in place. Finally, UCOR is reducing the risk of spreading contamination by using foam on internal pipe surfaces to fix internal contamination before segmenting the pipe.

In many cases, UCOR has been able to substitute less hazardous material or processes. For example, UCOR replaced transformers that contained petroleum-based oils with new vegetable-based oil dielectric medium transformers. It used fire-resistant materials to reroof Building 3026 cells at ORNL, originally designed with roofing materials that presented a fire hazard. Further, UCOR is replacing electric equipment that has not received approval by a nationally recognized testing laboratory. UCOR also installed a trailer in the central receiving area that provides workers with a location away from moving equipment.

There are several examples of engineered controls that UCOR initiated to reduce or eliminate hazards. UCOR installed concrete shielding over waste storage to reduce exposures at the waste storage facility and installed ventilation fans in flammable storage units to reduce the buildup of organic vapors. They installed drum vents to preclude drum over-pressurization and drum lid restraints while transporting drums. UCOR installed air filtration in the cabs of heavy equipment operating in potentially contaminated areas of building demolition to eliminate respiratory protection for operators. UCOR installed a rated tornado shelter at the Environmental Management Waste Management Facility (EMWMF) and is considering installing a similar shelter for D&D workers at ETTP.

UCOR uses administrative controls to enhance hazard reduction. Procedures, policies, and signs safely guide employees' daily work activities. Training empowers workers with the knowledge and skills to work in hazardous environments. Control points ensure only authorized personnel enter areas of active demolition. UCOR employs work-rest regimens for heat stress and uses a designated observer on an elevated platform watching D&D activities to identify potential hazardous situations.

An example where UCOR is demonstrating its concern for employees involves establishing administrative controls for working in high-heat, high-humidity summertime weather. UCOR is documenting the physical conditions of workers, such as heart rates, at the beginning and end of work periods for heat stress monitoring. By checking during the predetermined work-rest cycle, UCOR can closely monitor individuals for potential heat stress issues. UCOR is also using heart rate monitors and requiring individuals to self-monitor and exit the area to rest if they hit a predetermined set point. Additionally, UCOR provides cool rooms and cool chairs that use chilled water to expedite the workers' recovery from high-heat working conditions. UCOR also reduces the need for multiple layers of protective clothing in summertime operations to preclude heat stress. Even though the reduction of PPE may increase the potential for skin contamination, UCOR has decided the heat stress risk warrants the reduced PPE. UCOR is closely monitoring for any occurrence of skin contamination.

The Team observed personnel effectively wearing PPE, such as hardhats, safety glasses, reflective vests, hearing protection, and gloves. Additional requirements include safety shoes for designated areas. For electrical work, arc flash clothing and gloves are available. To reduce the size of piping and other components being disposed, UCOR created a segmentation shop. These activities normally require respiratory protection, multiple layers of protective clothing, such as Tyvek® suits and chemical gloves. The shop is an enclosure with ventilation controls to control potentially hazardous operations that may involve chemical or radiological constituents. The most recent operation involved drilling into small cylinders to sample for chemical and radiological content.

As mentioned previously, the UCOR IWCP applies to all work. This includes any surveillance and maintenance activities, one-time repairs, minor vehicle maintenance, preventive maintenance, or janitorial work to maintain facility cleanliness. The Team observed a planning meeting to cleanout of a weir on a tributary of Oak Creek. UCOR periodically performs this activity due to buildup of sediment and objects carried downstream, such as debris and logs. A portion of the meeting discussed the previous controls used and any that may provide additional safety. Controls previously identified included a barrier to prevent workers from entering the

deeper part of the stream (approximately 3 feet deep), wearing hip waders with soles to minimize slipping, maximum water depth for the work due to runoff potentials during rain events, and life vests in case someone slipped into the deeper part of the stream. Since there were new hazards identified, the group discussed new controls to the work package to eliminate or mitigate the identified new hazards. The group interactively determined that personnel should not be on the roadway due to vehicle traffic even though they would be wearing reflective vests. One of the new hazards included removal of a log and the means necessary to accomplish that task. Several members voiced their desire to accomplish this task with mechanical means (backhoe) as a way to minimize the potential for worker injuries, such as strains and sprains. This planning meeting was well executed with excellent worker involvement.

The Team reviewed several work packages provided by UCOR. For example, WP1-15-KD3155, *Process Electrical Isolations for Buildings K-131 and K-631,* contains pertinent precautions and limitations for workers that may encounter radioactive contamination; oil-stained, lead-jacketed wiring; poor lighting; low overheads; uneven flooring; water; silt residue; degraded ceiling tiles; slip, trip, and fall conditions; respiratory protection; and the need for nitrile gloves and booties for oils. The work package also contained controls for verifying absence of electrical energy, grouting/foaming activities, wearing criticality dosimetry, and positive control of mechanical lifting equipment.

Technical procedures also fall under the purview of the UCOR IWCP. The Team reviewed technical procedure PROC-KD-9073, *Performing Foaming Operations in the K-27 Building*. The format and content was consistent with the previously described maintenance planning observed by the Team and the work package described above. The precautions and limitations include floor collapse, exposure to hydrogen fluoride, monitoring requirements, respiratory protection requirements, radiological protection requirements, ventilation requirements, combustible loading limits, prohibition of refueling activities, prohibition of overnight vehicle parking near the enclosures, hot work requirements and controls, fire watch controls for foaming operations, and controls for energized power carts near foaming operations.

The UCOR Emergency Preparedness Program follows the DOE requirements in DOE Order 151.1C, *Comprehensive Emergency Management System*. DOE Guide 151.1-1A, *Emergency Management Fundamentals and the Operational Base Program,* provides further guidance on the intent of the order. The Team reviewed an external assessment of the ETTP emergency management program that occurred in January 2015. AECOM contracted with external experts to perform the assessment designed to identify strengths, weaknesses, and opportunities for improvement in the UCOR Emergency Management Program at ETTP. This assessment focused on any latent programmatic vulnerability that may be present using the judgements of need from the Waste Isolation Pilot Plant fire and radiological events. The recommendations included: completion of annual self-assessments; prioritize and implement appropriate corrective actions; increase drills and exercise frequency; and provide position-specific training for the emergency response organization positions, such as “categorization and classification” training for crises managers. The assessment found two noteworthy practices, three observations under program administration, two observations under training, drills, and exercises, three observations under emergency facilities and equipment, and one observation under technical planning basis.

In May 2015, DOE's Office of Enterprise Assessments (EA) performed a review of the ETTP emergency management program. UCOR provided the Team with a draft of the report that described the strengths of the program, but identified three weaknesses. The focus of the EA assessment included the K-27 building and the K-1065 Waste Management Complex.

In addition to reviewing these assessments, the Team reviewed the UCOR emergency action levels (EAL) for several of the ETTP buildings. Initiating events included natural phenomena, human errors, and their potential consequences. None of the assessments identified technical weaknesses in the EALs.

Discussions with UCOR emergency managers indicate that corrective actions are ongoing to address the vulnerabilities and weaknesses identified in the assessments. One of the needs UCOR is actively pursuing is finding and hiring qualified emergency management staff to help address the identified corrective actions. UCOR believes the emergency management organization is understaffed and needs at least three more staff members to effectively implement and maintain the program.

The previous contractor transferred the ETTP fire department support to the city of Oak Ridge, and a memorandum of understanding between DOE Oak Ridge, UCOR, and the city of Oak Ridge is in place. This memorandum delineates the fire support to ETTP and the interface between the fire department and emergency response at the ETTP site.

The UCOR radiation program is required to comply with 10 CFR 835, *Occupational Radiation Protection,* which establishes radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities. PPD-RP-4000 Rev 3, *Description for URS | CH2M Oak Ridge LLC, Oak Ridge, Tennessee Radiation Protection Program (RPP),* implements the requirements contained therein. Each facility/site is required to develop an RPP to comply with 10 CFR 835. The RPP contains control of residual radioactive contamination, including establishment and maintenance of radiologically controlled areas, sampling and characterizing radiologically contaminated media, internal and external dosimetry and instrument calibration, radiography, training exercises, radioactive material receipt and handling, radiation-generating devices, radioactive source control, instrumentation for detecting radioactivity, monitoring for surface and airborne radioactivity, and nuclear accident dosimetry.

The UCOR RPP uses UCOR employees and staff augmentation to support D&D, surveillance and maintenance, and operation of the LGWO facility. Currently, there are approximately 130 health physics technicians, 10 supervisors, and 5 certified health physicists on staff. For bioassay, they use an outside vendor to process samples. Recently, three UCOR technicians passed the National Registry for Radiation Protection Technologists (NRRPT) test. The NRRPT evolved from the need for improved training programs and certification of radiation protection technicians. Guided by the American Board of Health Physics, the certification program began in 1976. UCOR paid for their fees and study material, and they received company plaques for completing the certification.

The Team observed radiological technicians surveying trucks containing potentially contaminated debris from D&D activities for transport to the disposal site. The contaminants of

interest are radionuclides that decay by beta or alpha emission. Technicians use large area wipes to provide indications of potential contamination, and perform "technical" smears of one hundred square centimeters for loose contamination before they release vehicles for travel. During rainy or wet conditions, technicians must dry the technical smears to remove any shielding caused by moisture. These contamination surveys occur under a covered area to allow technicians to work during inclement weather. Supervisors stated that work is stopped when lightning or heavy rain occurs. The trucks travel on a designated "haul road" that is not open to other traffic. In addition to departure and arrival surveys, technicians drive vehicles with sensitive radiation detectors mounted on the rear of the vehicle along the "haul road" as a confirmatory measure that the arrival and departure surveys are effective.

The Team interviewed the radiation protection supervisor and technicians at EMWMF. This facility, a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-permitted landfill, receives the trucks transporting debris from D&D activities for disposal. The technicians survey the trucks at receipt, which confirms the departure surveys at the D&D site. The supervisor and technicians stated that loose radioactive contamination is rare.

Discussions with UCOR employees indicate that the UCOR occupational medical program is providing quality service to employees. The program has a staff physician, and the medical provider is Methodist Hospital in Oak Ridge. Other staff medical professionals (nurses) provide care for employees for physicals and return-to-work. Occupational medicine works with IH to provide workplace surveillances so employees receive medical evaluations for the work and hazards they encounter. The program provides medical testing, a respiratory-fit testing, fitness-for-duty examination, drug testing, return-to-work evaluations, counseling for employees on health issues, and a resource for employees with questions about prescribed medications that may affect their work performance. Frequently, the employee's personal physician is unaware of work activities (hazards, respiratory protection, etc.), and the program professionals provide an information conduit between the personal physician and the company. The Team's interviews with UCOR employees indicate that the employees rely upon and use the occupational medical program for information about personal medical questions, as well as company/work-related issues. The program, according to employees, is well respected and trusted. In addition to medical services, the program provides wellness support to employees. It provides counseling for weight loss; depression, and nutrition; presents lunch and learn sessions on wellness topics; participates in the annual Health and Safety Fair; and provides smoking cessation options. The program publishes articles for the UCOR wellness Web site, and weekly articles for the UCOR Newsline.

Conclusion

UCOR employs the hierarchy of controls to eliminate or mitigate hazards to the workforce. The wellness program, in conjunction with the medical provider, effectively engages employees to seek out ways to improve their health. UCOR's occupational medicine providers also counsel employees about health or job-related concerns that employees may have. UCOR is supporting certification of radiological technicians by funding study sessions and testing fees. The emergency management organization, although understaffed, is actively trying to meet obligations under the DOE Orders and is seeking additional staff to support that effort. UCOR meets the expectations in the Hazard Prevention and Control tenet for a DOE-VPP participant.

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 are capable of acting in accordance with managers' expectations and approved procedures.

UCOR trains workers to ensure they meet the training specified by their job requirements and work area requirements. For example, heavy equipment mechanics must stay current in their heavy equipment mechanics training. If they work on the equipment in a radiological control area, they must also meet the training requirements for the work area. Additional training requirements may come from DOE regulations and Orders, OSHA regulations, State regulations, and UCOR policies and procedures. Examples of required training include: radiological worker, confined-space entry, Hazardous Waste Operations and Emergency Response (HAZWOPER), asbestos, and UCOR corrective actions program. UCOR provides approximately 60 percent of its courses in the classroom, and the balance is computer-based training (CBT). CBT courses provide awareness training on a topic where a test is not required. Other CBT courses require passing a test; the worker will not receive credit for the course until the course material is completed and the worker passes the test. UCOR training provides workers with the knowledge and skills to perform their job safely.

Formal safety and health training is conducted by instructors using a classroom setting, seminars, and briefings. Workers use on-the-job-training (OJT) where it is applicable to ensure workers understand how to complete tasks. Workers take advantage of mockups to reinforce the practical aspect of hands-on training. Other examples include: (1) the use of a scaffold builder (provided by the unions), which requires the employee to build a scaffold that must pass inspection; (2) powered air-purifying respirator (PAPR) classroom training to include employees putting on the PAPR and performing preuse inspections; and (3) fall protection where employees put on the harnesses. Classroom training, OJT, and mockups continue to reinforce the need to conduct hands-on training.

Workers who may affect the safety basis with their involvement in the operations of hazard categories 1, 2, or 3 nuclear facilities comply with the training requirements in DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*. UCOR implements those requirements in *UCOR Nuclear and Radiological Facilities Qualification Standard*, UCOR-4113/R1. Examples of workers needing the training include nuclear criticality positions, nuclear/radiological facility managers, and USQD preparers. Managers document training and qualification requirements on qualification cards, and the Local Education Administrative Requirements Network (LEARN) system tracks the progress. All employees carry an access card on their lanyards that lists the basic training required for their position and the date through which it is valid. Additionally, training received outside of UCOR can be entered into LEARN if a certificate or other document is provided as proof of completion. The LEARN system is a repository for all employee training records and effectively tracks workers' training.

Every employee at UCOR has a position assignment form (PAF) in the LEARN database. The PAF includes the position assignment, training position description (TPD), qualification cards, and individual requirements. TPDs state the mandatory UCOR training required for employees.

Functional TPDs capture the roles, responsibilities, and required training for specific, functional positions, such as engineers, laborers, carpenters, and others. Project TPDs are unique to project positions. There are over 600 projects across UCOR, and a revision to the project carries into revisions of the associated TPDs.

UCOR uses 30 training points-of-contact (TPOC) to track training and schedule workers for courses. The LEARN system sends automated training reminders to employees at 90, 60, and 30 days before the training expires. If training is delinquent less than 30 days from expiration, the TPOC sends a weekly reminder by e-mail (including the first line supervisor if craft personnel do not have computer access) and contacts the supervisor. TPOCs schedule training for their workgroups, and can individualize LEARN to send training messages more often if they choose. The Training Manager meets quarterly with TPOCs to discuss training issues, identify improvements, and update information. TPOCs work closely with supervisors to maintain worker training proficiencies.

Managers and supervisors ensure that workers complete training before performing assigned work. Supervisors verify training and qualifications in POD meetings and when reviewing STARRT cards. Access and qualification cards are additional reminders to workers so they can readily check their training expirations to ensure the training does not lapse for the worker. UCOR senior staff receives monthly deficient training metrics that include training and reading delinquencies, and TPOCs receive the information weekly.

The superintendent, general foreman, or foreman verifies the workers' training at, or before, the weekly preevolutionary briefing. Supervisors and TPOCs can verify training by querying LEARN. Some projects have the required training built into LEARN as queries, and the resulting output is a matrix of individuals and their training status. Supervisors can also query LEARN on separate individuals or all members of a craft group to determine training status. The Team observed the use of the training matrix during POD meetings.

Employees receive block training twice a year. The training occurs during inclement winter weather and during the heat of the summer months to take advantage of work slowdown. Block training consists of Park Worker training (required for all new employees, and every 2 years thereafter), asbestos awareness, hearing conservation, firewatch, electrical safety for nonelectrical workers, conduct of operations, and radiological worker practical factors. Once the course is completed, the training record updates with the new completion date.

Driven by the UCOR Strategic Plan, the safety culture survey results, and the VPP gap assessment, UCOR promotes soft-skills development, such as communications and active listening. To assist in this effort, UCOR purchased a suite of customizable training courses. The classroom courses include instructor guides, student guides, handouts, slides, tests, and exercises for students. Many of the courses are a week in duration, but UCOR is shortening the courses to balance supervisor time in the classroom with production. The Training Manager plans to revise five of the courses that will create a supervisor TPD, and later be the core for the Leadership Development Program. UCOR is committing resources to the leadership development of its people.

UCOR relies on subcontractors to provide the majority of training. SMEs team with Training to provide expert knowledge of the material and help forge the training format. A new course

offering is Dominance, Influence, Steadiness and Compliance (DISC). DISC training identifies and explains an individual's personality type and gives insight to improve working with others. The Training organization consists of a manager and deputy, three full-time trainers, one part-time trainer, and a records and scheduling administrative person. The four trainers have offices in Oak Ridge, but conduct classroom training at the UCOR site.

Conclusion

UCOR provides training to workers to ensure they are proficient in their job and recognize hazards of different work areas. The majority of training occurs in classrooms and requires demonstration of skills on mockups and tests. UCOR has an effective program to verify the worker is current in his/her training prior to letting them work. The managers recognized the need to improve training for supervisors and recently purchased a new software package to help train the soft skills. UCOR meets the expectations for the Safety and Health Training tenet for a DOE-VPP participant.

VIII. CONCLUSIONS

From the first day of its contract, UCOR has established a strong working partnership between the company and its workforce. Safety on the jobsite has been an all-encompassing value for managers and workers alike. The combination of experience from other DOE sites and local knowledge of the site history has created a strong culture of effective contract performance because of safety. UCOR continues to establish effective policies, processes, and procedures that provide workers the tools and guidance they need. UCOR effectively minimizes schedule pressure, both real and perceived, and encourages workers to take the time necessary to understand the work, control the hazards, and not accept risks without appropriate approvals. In all respects, UCOR demonstrates the performance expected of a DOE-VPP site. The Team recommends that DOE admit UCOR to DOE-VPP as a Star participant.

APPENDIX A

Management

Matthew B. Moury
Associate Under Secretary for
Environment, Health, Safety and Security

Stephen A. Kirchhoff
Deputy Associate Under Secretary for
Environment, Health, Safety and Security

Patricia R. Worthington, PhD
Director
Office of Health and Safety
Office of Environment, Health, Safety and Security

Bradley K. Davy
Director
Office of Worker Safety and Health Assistance
Office of Health and Safety

Onsite VPP Assessment Team Roster

Name	Affiliation/Phone	Project/Review Element
Bradley K. Davy	DOE/AU (301) 903-2473	Team Lead Management Leadership
Brian A. Blazicko	DOE/AU	Worksite Analysis, Safety and Health Training
John A. Locklair	DOE/AU	Hazard Prevention and Control, Employee Involvement
Brenda Kelly	Savannah River Nuclear Solutions, LLC/Savannah River Site	Employee Involvement, Safety and Health Training
Larry Baker	Los Alamos National Security, LLC/Los Alamos National Laboratory	Worksite Analysis