



URS | CH2M OAK RIDGE LLC

**Report from the Department of Energy
Voluntary Protection Program
Onsite Review
June 3-14, 2019**



U.S. Department of Energy
Office of Environment, Health, Safety and Security
Office of Health and Safety
Office of Worker Safety and Health Assistance
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FOREWORD

The Department of Energy (DOE) recognizes that true excellence can be encouraged and guided, but not standardized. For this reason, on January 26, 1994, the Department initiated the DOE Voluntary Protection Program (VPP) to encourage and recognize excellence in occupational safety and health protection. This program closely parallels the Occupational Safety and Health Administration (OSHA) VPP. Since its creation by OSHA in 1982, and implementation by DOE in 1994, VPP has demonstrated that cooperative action among Government, industry, and labor can achieve excellence in worker safety and health.

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.

DOE bases requirements for DOE-VPP participation 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 open to all contractors in the DOE complex including 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 levels with names and functions similar to those in OSHA's VPP: Star, Merit, and Demonstration. The Star level is the core of DOE-VPP. This level recognizes outstanding protectors of employee safety and health. The Merit level is a steppingstone for participants that have good safety and health programs, but need time and DOE guidance to achieve Star status. The Demonstration level allows DOE to recognize achievements in unusual situations about which DOE needs to learn more before determining approval requirements for the Merit or Star level.

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 triennial onsite review of URS | CH2M Oak Ridge LLC (UCOR) at the Oak Ridge Reservation in Tennessee, conducted June 3-14, 2019, and provides the Associate Under Secretary for Environment, Health, Safety and Security with the necessary information to make the final decision regarding UCOR's continued participation in DOE-VPP at the Star level.

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ABBREVIATIONS AND ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AU	Office of Environment, Health, Safety and Security
BCSP	Board of Certified Safety Professionals
CBT	Computer-Based Training
D&D	Decontamination and Demolition
DART	Days Away, Restricted or Transferred
DOE	Department of Energy
ECF	Excess Contaminated Facilities
ES&H	Environment, Safety, and Health
ETTP	East Tennessee Technology Park
FM	Facility Manager
HAZWOPER	Hazardous Waste Operations and Emergency Response
IH	Industrial Hygiene
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
IWCP	Integrated Work Control Program
JHA	Job Hazards Analysis
LEARN	Local Education Administrative Requirements Network
LSIT	Local Safety Improvement Team
MSRE	Molten Salt Reactor Experiment
NAICS	North American Industry Classification System
OOCE	ORNL Operations and Cleanup Enterprise
OREM	Oak Ridge Office of Environmental Management
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OSHT	Occupational Safety and Health Technician
PAF	Position Assignment Form
PAPC	President's Accident Prevention Council
POD	Plan-of-the-Day
POMC	Performance Objectives, Measures and Commitments
PPE	Personal Protective Equipment
QARP	Questioning Attitude Recognition Program
SME	Subject Matter Expert
STARRT	Safety Task Analysis Risk Reduction Talk
STS	Safety-Trained Supervisor
TAC	Training Access Card
Team	Office of Environment, Health, Safety and Security DOE-VPP Team
TPD	Training Position Description
TPOC	Training Point-of-Contact
TRC	Total Recordable Case
TROTS	The Rest of the Story
UCOR	URS CH2M Oak Ridge LLC
USW	United Steel Workers
VPP	Voluntary Protection Program
VR	Virtual Reality
Y-12	Y-12 National Security Complex

EXECUTIVE SUMMARY

The Department of Energy's (DOE) Voluntary Protection Program (VPP) Assessment Team (Team) from the Office of Environment, Health, Safety and Security (AU) recommends URS | CH2M Oak Ridge LLC (UCOR), at the Oak Ridge National Laboratory, Y-12 National Security Complex, and East Tennessee Technology Park in Oak Ridge, Tennessee, continue to participate in the DOE-VPP at the Star level based on the onsite review conducted June 3-14, 2019.

UCOR is an AECOM-led partnership with Jacobs contracted with the DOE Office of Environmental Management at Oak Ridge (OREM) to conduct cleanup work at the DOE Oak Ridge Reservation. UCOR also conducts surveillance and maintenance activities and operates the Reservation's primary waste disposal cell. UCOR employs about 1,800 people. The contract is a cost-plus-award fee contract with performance-based incentives for the completion of the decontamination and demolition and environmental remediation work and runs through July 2020.

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 Local Number 9-288, the Atomic Trades and Labor Council, and the Knoxville Building and Construction Trades Council collectively represent about 700 UCOR employees.

UCOR's injury and illness rates remain significantly lower than its comparison industry. UCOR works to maintain compliance with appropriate DOE, OSHA, local, State, and Federal safety requirements and strives to exceed those requirements.

UCOR managers understand the value of empowering the workforce, ensure workers have the tools and training they need, and respond to worker concerns and suggestions. They have built strong relationships with workforce leaders, and have earned workers' trust. They demonstrate their commitment to exceeding requirements as a value-added means of completing the UCOR mission. UCOR managers are visible, accessible, and credible to employees, and help workers resolve concerns, suggest improvements, and work safely.

UCOR encourages and supports employee involvement through numerous opportunities, including Local Safety Improvement Teams, Questioning Attitude Recognition Program, and campaigns to improve the safety culture within the company. UCOR communicates to employees via its safety committees, newsletters, and other media. Workers have no fear of reprisal for pausing work for clarification or a safety concern.

The UCOR work planning and control system ensure workers understand the hazards they might encounter during the course of work. Workers and subject matter experts plan the work. The processes to identify and analyze hazards, and identify necessary controls capture the analysis and encourage planners to follow the hierarchy of controls. UCOR is incorporating lessons learned from other DOE and commercial sites to anticipate unusual and unique hazards. Although UCOR is conducting many site inspections and walk downs, it should better coordinate those efforts, develop specific checklists, and document results to avoid complacency in worksite inspections, and help prevent unsafe conditions from developing, particularly in areas where the workforce may have less experience.

UCOR takes the health and welfare of its staff, staff augment, and contractor workforce seriously. They effectively control hazards using the hierarchy of controls. UCOR involves workers in work planning and package development to leverage workers' understanding of conditions, hazards, and their experience controlling those hazards. Managers and supervisors seek and respect the workers' opinions and ideas before finalizing work packages or implementing solutions. UCOR provides a full range of medical services, emergency response and planning, and wellness program support. UCOR's injury and illness rates are below the rates of comparative industry average and reflect effective hazard prevention and control methods.

UCOR provides workers with the training, knowledge, and skills to perform their jobs safely. UCOR develops appropriate training for each worker. UCOR continues to support participation in the Board of Certified Safety Professionals' Safety-Trained Supervisor and Occupational Safety and Health Technicians programs by paying the associated fees.

Since 2015, UCOR has continued its strong working partnership between the company and its workforce. Safety on the jobsite is an all-encompassing value for managers and workers alike. The combination of experience from other DOE sites and local knowledge of the site history creates a strong safety culture resulting in effective contract performance. The atmosphere created by UCOR at the jobsites is allowing UCOR to further accelerate cleanup at the Oak Ridge reservation, protect the environment, and establish a safer working environment for any following cleanup contracts. Cost savings from the cleanup mission have allowed DOE to implement additional remediation and infrastructure improvements, which, in turn, helps the other contractors at the Oak Ridge Reservation reliably perform their mission. UCOR's involvement in the community and promotion of entry level labor through its union partners is helping change the workforce culture beyond UCOR's specific projects. 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.

**TABLE 1
OPPORTUNITIES FOR IMPROVEMENT**

Opportunity for Improvement	Page
UCOR should review its policy of assigning heat stress monitoring duties to workers, and remind workers that they can refuse the assignment without fear of retribution if they are not comfortable with those responsibilities.	6
UCOR should begin emphasizing to workers that they must take ownership of the cultural improvements made over the past 9 years. By owning the improvements, workers can help prevent any new leaders from making missteps after transition that will degrade the existing workforce culture.	7
UCOR should ensure its system of workplace inspections includes criteria that will remind personnel to look for deteriorating housekeeping and noncompliant conditions, and ensure the frequency and scope of compliance verifications meet the DOE-VPP criteria.	13
UCOR should consider comparison tests between the real-time heart rate monitoring system and 15-minute data logging practices, validate its heat stress monitoring practices meet ACGIH recommendations, seek assistance from the heart rate monitoring system vendor, and revise its heat stress monitoring procedure based on those actions.	17
UCOR should encourage more workers from its other D&D worksites to use the VR training at ETTP as part of the workers' qualification and requalification process.	23

I. INTRODUCTION

This report provides the Department of Energy's (DOE) Associate Under Secretary for Environment, Health, Safety and Security (AU) the results of the triennial onsite review of URS | CH2M Oak Ridge LLC (UCOR) at the Oak Ridge Reservation. The DOE Voluntary Protection Program (DOE-VPP) Assessment Team (Team) recommends that UCOR continue participating in DOE-VPP at the Star level.

The DOE-VPP encourages excellence in occupational safety and health protection by recognizing DOE contractors and subcontractors who demonstrate safety programs that surpass compliance with DOE, Occupational Safety and Health Administration (OSHA), local, State and Federal safety standards.

The Star level is the core of DOE-VPP. This level recognizes outstanding protectors of employee safety and health. A participant at the Star level should be a model for other members of its industry and other DOE contractors and subcontractors. Because this is a dynamic continuous improvement program, participants cannot allow their efforts to stagnate. Approvals are not limited to set durations, but they are subject to triennial re-evaluation by DOE to ensure that the participant still warrants Star level.

UCOR is an AECOM-led partnership with Jacobs contracted by the DOE Office of Environmental Management at Oak Ridge (OREM) to conduct cleanup and other associated operations on the DOE Oak Ridge Reservation. The reservation includes the East Tennessee Technology Park (ETTP), Y-12 National Security Complex (Y-12), and the Oak Ridge National Laboratory (ORNL) sites. These areas include former uranium enrichment facilities for commercial nuclear power and defense programs, research and development activities, and environmental cleanup missions. UCOR is engaged in decontamination and demolition (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, including surveillance and maintenance, engineering, and operations of smaller facilities. Support services include project planning; integration and controls; business management; environment, safety, and health (ES&H); and quality assurance.

The original project scope focused on facilities that were part of ETTP and included the 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 about 1,800 people with approximately 700 of those being subcontractors. The contract is a cost-plus-award fee contract with performance-based incentives for the completion of D&D and environmental remediation work, and runs through July 2020. The current annual budget is \$416 million.

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 initial DOE-VPP application. United Steel Workers (USW) Local Number 9-288, Atomic Trades and Labor Council, and Knoxville Building and Construction Trades Council collectively represent about

700 UCOR employees. Each of these unions endorsed the UCOR DOE-VPP application and partnership to keep workers safe.

UCOR submitted its DOE-VPP application in April 2014, and was approved at the Star level in 2015. In 2015, UCOR had established a strong working partnership between the company and its workforce. Safety on the jobsite was an all-encompassing value for managers and workers alike. The combination of experienced personnel from other DOE sites and local knowledge of the site's history had created a strong culture of effective contract performance because of safety. UCOR's policies, processes, and procedures provided workers the tools and guidance they needed to perform their jobs safely. UCOR effectively minimized schedule pressures, both real and perceived, and encouraged workers to take the time necessary to understand the work, control the hazards, and not accept risks without appropriate approvals. Continued participation in the DOE-VPP requires a triennial assessment.

A team made up of personnel from the Office of Worker Safety and Health Assistance (AU-12) and other DOE-VPP participants performed the onsite review in accordance with DOE-STD-1232-2019/4, *U.S. Department of Energy Voluntary Protection Program-Onsite Review Volume 4 of 4*. The onsite review, conducted June 3-14, 2019, included document reviews of UCOR programs and procedures, interviews with managers, supervisors, workers, and support staff, and work observations. The Team also met with OREM and the union leaders. The Team reviewed accident and injury reports and logs, and walked down work areas.

UCOR reported 53 occurrences in the DOE's Occurrence Reporting and Processing System from 2016 to 2019. Some of the occurrences involved the discovery of unexpected radioactive contamination. Collectively, the occurrences identified concerns regarding conduct of operations, infrastructure, and aging facilities. The occurrences included repositioning valves in a confined space/radiation area without appropriate work authorization, multiple lockout/tagout procedure violations, and several cases where workers encountered unexpected energized equipment.

In 2018, the DOE Office of Enforcement investigated the unauthorized operation of valves at the Molten Salt Reactor Experiment (MSRE). The investigation determined UCOR's implementation of work control processes was inadequate to prevent the unauthorized valve manipulation. UCOR agreed to a consent order that included several corrective actions. Those corrective actions are complete.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (UCOR)					
Calendar Year	Hours Worked	TRC*	TRC Rate per 200,000 hours	DART** Cases	DART Case Rate per 200,000 hours
2016	2,607,680	6	0.5	5	0.4
2017	2,749,000	11	0.8	4	0.3
2018	3,143,230	10	0.6	4	0.3
3-Year Totals	8,499,910	27	0.6	13	0.3
Bureau of Labor Statistics (BLS-2017) average for NAICS*** 562 Waste Management and Remediation Services			4.2		2.7
Injury Incidence/Lost Workdays Case Rate Subcontractors (UCOR Subcontractors)					
Calendar Year	Hours Worked	TRC	TRC Rate per 200,000 hours	DART Cases	DART Case Rate per 200,000 hours
2016	394,034	0	0.0	0	0.0
2017	368,913	3	1.6	2	1.1
2018	452,586	3	1.3	0	0.0
3-Year Totals	1,215,533	6	1.0	2	0.3
Bureau of Labor Statistics (BLS-2017) average for NAICS*** 562 Waste Management and Remediation Services			4.2		2.7

* Total Recordable Cases

** Days Away, Restricted or Transferred

*** North American Industry Classification System

TRC Incidence Rates, including subcontractors: 0.68

DART Case Rates, including subcontractors: 0.31

Discussion

UCOR's injury and illness rates remain lower than its comparison industry. To date, in 2019 UCOR has experienced three recordable cases, but no DART cases. First-aid cases have risen in the past 3 years from 42 in 2016 to 87 in 2018. UCOR has 38 first-aid cases year-to-date for calendar year 2019, reflecting a decrease extrapolated through the end of year. UCOR trains and encourages personnel to report injuries, illnesses, and first-aid cases without fear of reprisal. The AU DOE-VPP Team (Team) did not identify any disincentives to injury reporting. UCOR's injury rates meet the expectations for continued DOE-VPP participation.

III. MANAGEMENT LEADERSHIP

Management leadership is a key element to obtaining and sustaining an effective safety culture, and implementing the guiding principles of Integrated Safety Management (ISM). The contractor shall demonstrate senior level management commitment to ISM and occupational safety and health, and to meeting the requirements of DOE-VPP. Management systems for comprehensive planning shall address health and safety requirements and initiatives. Elements of that management system shall 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 shall be visible, accessible, and credible to employees. As with any other management system, the organization shall integrate authority and responsibility for employee health and safety with its management system, and shall involve employees at all levels of the organization.

In 2015, UCOR had established an experienced and knowledgeable management team fully committed to effective contract performance through safety. It had invested the necessary time and resources to establish trust and respect with the workforce. Managers were visible and accessible in the workspaces, and their dedication to supporting the workforce as a means of achieving contract success was paying huge dividends on the cost and schedule performance.

UCOR has implemented an effective safety management system and integrated ES&H into work planning and execution. Several policies and practices contribute to this integration. UCOR accepts responsibility for the safety of employees and the public. Unambiguous lines of authority and responsibility for ES&H at all levels help ensure all personnel possess the skills, abilities, and resources necessary to discharge their responsibilities. A common phrase among the management team was making UCOR *investment worthy* by demonstrating their continued ability to deliver mission scope safely, on time, on budget (or under budget), and refusing to take shortcuts. UCOR's commitment to this principle has helped it achieve its cleanup goals 4 years ahead of schedule.

The contract requires UCOR to hire a significant number of subcontractors. In many cases, UCOR meets these goals by hiring subcontractors as *staff augmentations*. These personnel are virtually indistinguishable from UCOR employees in their roles and responsibilities. In some cases, *staff augmentation* personnel are supervising and managing UCOR employees.

Senior managers within the Project Execution and Operations organization are service-oriented towards the workforce, believing their job is to ensure workers have the right tools, procedures, training etc., to perform their work, and support (or insist) that workers pause or stop work if they have any questions or concerns. Managers do not expect special treatment when at the worksites; they obey all the same rules, and have a good working relationship with the workforce. The ETTP Cleanup Enterprise Manager, with approximately 700 people in his organization, does not even have a designated parking space, which sets an example for the rest of the managers and supervisors.

Managers are committed to protecting the workforce. They seek input from craft personnel on how to solve problems and plan work. In many cases, UCOR managers empower workers to identify and solve problems on their own. Managers are present and visible in the work areas, often making multiple trips daily into work locations. Many UCOR senior managers maintain all the necessary qualifications and training to enter hazardous areas (e.g., Hazardous Waste

Operations and Emergency Response (HAZWOPER), Radiation Worker, and Respirator qualification, training, and fit-test) in order to visit workers in their work locations, and help understand worker concerns and issues.

UCOR has hired new managers with experience at other D&D projects to help overcome the technical challenges posed by some new work in the Excess Contaminated Facilities (ECF) project. The new ECF Field Execution Manager is bringing lessons learned from his experience working at the Idaho Cleanup Project. For example, he has tasked a manager to lead a team survey of the 9207 Biology Building for “pitfalls.” These pitfalls are small pieces of equipment that may contain unidentified hazardous materials (capillary lines containing a sodium-potassium mixture, refrigerants, or other unidentified chemicals). UCOR is photographing these items, marking them with pink paint, and tagging them with a bright yellow tag to warn workers to contact their facility manager before removing the items. The ECF Field Execution Manager is also researching building history and events that might identify other, yet unidentified, hazards within the building.

UCOR managers are proving their commitment to providing a safe place to work, retaining its human capital, and maintaining certification as a DOE-VPP Star worksite by providing the tools and resources necessary to ensure every employee goes home in the same condition as when they came into work. Although managers know the end of this contract is approaching in July 2020, they continue to support VPP efforts by empowering workers’ involvement in decision making and the development of work packages. The president stated, “*They own this,*” referring to worker engagement, involvement, return-on-investment, and participation in DOE-VPP.

UCOR’s commitment to its workforce is evident in several initiatives that enhance trust and build relationships. UCOR has two active groups supporting opportunities for young professionals to develop networks and pursue professional development. The UCOR Young Professionals group combines both learning opportunities and social activities. The second are the AECOM Functional Area Coordination Teams. These teams bring functional area personnel together from across AECOM projects to share lessons learned and new ideas. UCOR also supports workforce development opportunities through the UCOR University, and the Board of Certified Safety Professionals (BCSP) certifications. UCOR expects all personnel in supervisory positions to complete the BCSP Safety-Trained Supervisor (STS) certification (see Safety and Health Training).

UCOR has an excellent relationship with the unions representing workers. The unions rarely file grievances, and the UCOR labor relations manager has a reputation with the unions of adjudicating labor issues consistently and fairly. The UCOR president meets monthly with the union stewards and safety advocates. UCOR has also facilitated transfers of personnel from USW into the other unions as the USW-covered work is completed. Although workers may lose their union seniority, they retain their company service credit. UCOR has also assisted one of its subcontractors in establishing a bargaining agreement with the health physics technicians that recently voted for union representation.

UCOR is working with DOE to help keep trained workers onsite and minimize the risk of significant workforce downsizing at the end of the UCOR contract. Managers have implemented several programs to retain skilled and trained workers onsite by assisting labor in craft retention, transition, and incentive programs because, as the president stated, “it is the right thing to do.” UCOR has a progressive discipline policy that is the same for bargaining unit and nonbargaining

unit personnel. All three union presidents were complimentary of how UCOR has treated their workers.

The UCOR President's Accident Prevention Council (PAPC) leads UCOR's various safety committees. It includes a cross-section of personnel from the whole organization, including employees, subcontractors, and staff augmentation personnel with diverse roles and responsibilities. The council includes the UCOR President/Chief Executive Officer, Safety Systems and Services Manager, Local Safety Improvement Team (LSIT) Chairs, VPP Coordinator, and representatives from each of the bargaining units. The PAPC evaluates UCOR's safety culture and recommends improvements. It meets on a regular frequency to discuss recommendations regarding actions for continuous improvement, and provides periodic reports and updates to senior managers and the workforce. The PAPC promotes employee participation in accident prevention, hazard control, environmental protection, and wellness initiatives. It contributes to the partnership between the workforce and managers. It also helps strengthen communications, promote continuous improvement, and promote cooperation on environment, safety, and health issues.

UCOR may not have sufficient industrial hygiene (IH) technicians to implement the IH protection strategies associated with the company's desired level of worker protection. This shortage arises from a combination of factors, such as insufficient IH technicians available in the local workforce, and insufficient numbers identified in staffing plans. UCOR is assigning some tasks that are better suited to IH technicians to members of the work crews such as heat stress monitoring. Although UCOR allows workers to refuse the monitoring assignment if the workers do not believe they are qualified or ready to perform the monitoring, workers interviewed by the Team were reluctant to refuse that assignment. In some cases, they were encouraged by their peers to accept the assignment as a means of looking out for each other. Some workers were uncomfortable directing their coworkers to stop and rest based on the monitoring data, believing direction was a supervisory function. UCOR should review its policy of assigning heat stress monitoring duties to workers, and remind workers that they can refuse the assignment without fear of retribution if they are not comfortable with those responsibilities (see Hazard Prevention and Control).

Opportunity for Improvement: UCOR should review its policy of assigning heat stress monitoring duties to workers, and remind workers that they can refuse the assignment without fear of retribution if they are not comfortable with those responsibilities.

In March 2018, UCOR agreed to a Consent Order from DOE to resolve issues that led to nuclear safety deficiencies at the Molten Salt Reactor Experiment. No personnel were injured, but the events identified unacceptable practices and conditions, which had developed over the years. Under the agreement, UCOR committed to several actions, all of which are complete.

Improvements in conduct of operations, as well as safety practices within the ORNL Operations and Cleanup Enterprise (OOCE), have produced improvement in operational capability, mission delivery, as well as worker safety and health. This improvement demonstrates the beneficial effects of establishing a positive safety culture and maintaining VPP participation, and UCOR should look for opportunities to share its experiences and lessons learned with other DOE contractors.

UCOR has an active communication program. The External Affairs, Communications, and Community Programs manager maintains a living strategic communication plan. A Safety Communications Committee composed of safety and health managers meets periodically to identify topics of interest and determine optimal communication pathways. Posters, bulletin boards, e-mails, newsletters, and meetings all communicate information to workers. UCOR might benefit from more worker representation on the safety communications committee. It might consider asking for one volunteer from each LSIT to participate on the safety communication committee as a means of providing feedback on communication effectiveness.

UCOR publishes and distributes several newsletters on a regular basis through the UCOR Web site, such as the Safety Advocate newsletter. The newsletter is the central corporate newsletter, and includes UCOR's monthly safety statistics, safety promotions, focus area discussions, employee recognition (i.e., QARP), and wellness activities. Two projects publish individual newsletters. The ETTP group publishes a monthly newsletter titled the "Vision" and the ORNL project publishes the "Link" newsletter. Each project newsletter focuses on communicating current events and project accomplishments.

UCOR installed Media Blitz TV monitors throughout UCOR's facilities to share safety messages, reminders, and other employee information. The information includes new employee hire information, weather announcements, and current safety initiatives promoted by UCOR VPP and LSIT programs. UCOR has placed TV monitors in most trailers and breakrooms across the UCOR projects. As UCOR adds projects, it is evaluating additional locations to install Media Blitz monitors.

UCOR managers face a challenge in the coming year as the contract approaches its end in July 2020. OREM has not yet identified the contract strategy following the UCOR contract, and UCOR is already working to allay workers' concerns about their future at the site. UCOR frequently talks to workers at all levels about the amount of remaining work at the site, which will take many more years to complete. As it prepares for any coming transition, UCOR should begin emphasizing to workers that they must take ownership of the cultural improvements made over the past 9 years. By owning the improvements, workers can help prevent any new leaders from making missteps after transition that will degrade the existing workforce culture.

Opportunity for Improvement: UCOR should begin emphasizing to workers that they must take ownership of the cultural improvements made over the past 9 years. By owning the improvements, workers can help prevent any new leaders from making missteps after transition that will degrade the existing workforce culture.

Conclusion

UCOR managers understand the value of empowering the workforce, ensure workers have the tools and training they need, and respond to worker concerns and suggestions. They have built strong relationships with workforce leaders, and have earned workers' trust. They demonstrate their commitment to exceeding requirements as a value-added means of completing the UCOR mission. UCOR managers are visible, accessible, and credible to employees, and help workers resolve concerns, suggest improvements, and work safely. UCOR meets the DOE-VPP Management Leadership expectations for continued participation in DOE-VPP.

IV. EMPLOYEE INVOLVEMENT

Employees at all levels shall 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 shall work together to establish an environment of trust where employees understand that their participation adds value, and is welcomed. Managers shall be proactive in recognizing, encouraging, facilitating, and rewarding workers for their participation and contributions. Both employees and managers shall communicate and collaborate in open forums to discuss continuing improvements, recognize and resolve issues, and learn from their experiences. .

In 2015, UCOR encouraged and supported employee involvement in safety forums, work groups, and campaigns to improve the safety culture within the company. UCOR recognized employees via newsletters and other media for contributing to a safe work environment. Workers received rewards through drawings upon submission of ideas or improvements. Workers had no fear of reprisal for pausing work for clarification or a safety concern. UCOR encouraged workers to pause work and have a questioning attitude. UCOR has continued and expanded these practices since 2015.

UCOR employees have numerous methods and opportunities to become engaged through programs and activities offered by the company. Examples include: Local Safety Improvement Teams (LSITs), LSIT Safety Observation Cards Program, Questioning Attitude Recognition Program (QARP), safety meetings, Safety Play Books, and numerous safety and health activities offered through the Wellness Committee. UCOR has supported workers obtaining and maintaining professional certification for Safety-Trained Supervisor (STS) and, more recently, Occupational Safety and Health Technician (OSHT) certification by paying applicable Board of Certified Safety Professionals (BCSP) fees.

LSITs include a cross-functional representation of volunteers within the respective organizations. They meet monthly to review safety observations and incident/injury/illness data, develop corrective actions, and monitor the progress of issue resolution. LSITs encourage UCOR direct hire and subcontractor employees to contribute to the safety culture by promoting continuous safety improvement, enhancing safety awareness, and sharing lessons learned in a team environment. LSITs encourage employee feedback, involvement, and foster open communication and mutual trust between employees and managers. The LSITs operate with a high degree of management support and involvement.

UCOR currently has eight LSITs representing its employees across its activities. Each LSIT has a management sponsor, a chairperson, and a written charter, which describes its objectives, roles and responsibilities, and operating guidelines. Other volunteers attend the LSIT meetings each month to review safety observation data, share information, and track progress on safety action items.

The LSIT Management Champions provide financial and personnel resources to facilitate the LSIT process and the resolution of safety-related issues. They ensure team members are allowed time away from work routines to: attend LSIT meetings and events, address safety-related

issues, monitor resolution of safety-related issues, assist as necessary to ensure completion of actions, and provide positive reinforcement and recognition.

The LSIT chairs/cochairs prepare for, and conduct, regularly scheduled monthly and ad hoc LSIT meetings. They collaborate with coworkers and managers to identify and address concerns and provide prompt feedback, share information regarding issues and resolutions at plan-of-the-day (POD) meetings, staff meetings, and other venues. They also elevate disputes and/or unresolved safety-related issues to the LSIT Management Champion and participate in monthly LSIT forums.

The UCOR LSITs manage the Safety Observation Card Program to promote employee input to prevent injuries and illnesses by identifying and correcting at-risk behaviors and work area conditions posing a risk to the safety and health of people or the environment. UCOR initially created the program to encourage workers to observe others and communicate both positive and at-risk observations. However, the employees' submissions mainly focus on at-risk conditions and only occasionally address observations related to employee safety behaviors. UCOR recognizes the Safety Observation Card Program has shifted from a behavior-based safety program toward an employee safety issues identification program. UCOR values the employees' continued input into the program and its progress toward improved safety across the projects.

UCOR holds monthly drawings from submitted cards to encourage employees to submit Safety Observation cards. UCOR provides each LSIT a budget ranging from \$1,500 to \$3,000 (based on the number of employees each LSIT represents). The LSIT chair uses that funding to purchase the recognition prizes awarded each month during the LSIT meetings. Awards include safety-related prizes, such as flashlights, car battery jump boxes, or safety sunglasses. LSIT Safety Observation card submissions and closures demonstrate that UCOR has dedicated significant resources to ensure closure of employee-raised safety concerns. UCOR managers' commitment to identify and provide financial resources to ensure closure of employee-identified safety concerns has greatly contributed to the workers' belief that the company values their input and is invested in ensuring workers perform work safely.

The Team attended several LSIT-related meetings, including two LSIT meetings, an LSIT Forum, and the ORNL Operations and Cleanup Enterprise (OOCE) LSIT safety walkdown meeting. All observed meetings demonstrated active employee involvement and effective manager to craft communication. The Team observed multiple examples of active listening and collaboration on ideas between managers and crafts. During the LSIT Forum, the management cochair took the opportunity to recognize and present pins and an appreciation card to all participants for their efforts to provide support for the VPP evaluation. The LSIT process effectively encourages worker and manager collaborations and involvement in all aspects of work.

UCOR implemented the QARP in 2014. The VPP Committee manages the QARP. The program encourages workers to adopt a questioning attitude towards work assignments and facility conditions and to stop/pause work until their issue is adequately addressed. Any employee or supervisor can nominate an employee for his or her questioning attitude action either by written form, verbally to a supervisor, or electronically online. The QARP committee evaluates employee submissions each month (subjectively) to select the best employee submission for recognition with a safety prize. The prizes include a variety of safety items, such as flashlights, car battery jump boxes, safety sunglasses, etc. The QARP also ensures

recognition of the employee supervisor to credit the supervisors promoting workers' questioning attitude.

The UCOR VPP committee manages and distributes the Safety Playbook, an interactive educational tool used to enhance communications among employees, supervisors, subcontractors, and managers. It is intended to heighten awareness for the recognition, identification, and control of workplace hazards to eliminate injuries and illnesses at UCOR. The Safety Playbook requires employees to complete six of the core requirements (also referred to as the "home runs"), plus nine additional requirements of the employee's choice. Upon completion of the playbook, employees have their supervisors review and sign the playbook for approval. UCOR invites all employees who satisfactorily complete the playbook to the quarterly celebration luncheon provided by UCOR. The VPP committee tracks employee involvement for this program and within the last 6 months experienced an impressive 98 percent participation rate.

Conclusion

UCOR encourages and supports Employee Involvement through numerous opportunities including LSITs, QARP, and campaigns to improve the safety culture within the company. UCOR communicates to employees via its safety committees, newsletters, and other media. Workers have no fear of reprisal for pausing work for clarification or a safety concern. Employees trust their managers and believe *safety is a value* 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. UCOR meets the expectations of Employee Involvement for a DOE-VPP participant.

V. WORKSITE ANALYSIS

Management of health and safety programs begins with a thorough understanding of all hazards that workers might encounter during the course of work, and the ability to recognize and correct new hazards. The first two core functions of ISM, 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. Work planners shall use the results of the analysis in subsequent work planning efforts. Effective safety programs also integrate feedback from workers regarding additional hazards that they encounter, and include a system to address new or newly recognized hazards. Successful worksite analysis also involves implementing preventive and/or mitigating measures during work planning to anticipate and minimize the impact of such hazards.

In 2015, UCOR had an effective work control program to define the scope of work, analyze the hazards, and recommend appropriate controls. UCOR used many sources of information about processes that existed within facilities to define a workscope, and used workers in the planning process to analyze the hazards and implement controls. The ES&H organization was involved in gathering data to define work hazards and implement controls for activities.

UCOR continues to use *Integrated Work Control Program (IWCP)*, PROC-FS-1001, to screen work into three risk-based category types (types 1, 2, and 3). It develops both maintenance work and operational procedures using PROC-FS-1001. The requesting Facility Manager (FM), in concert with the necessary ES&H subject matter experts (SME), determines if the hazards warrant a job hazard analysis (JHA). For work that does not require a JHA, the FM uses Form-2313, *UCOR Exempt List*, and Form-789, *Type 3 Work Determination*. These two forms and the instructions in PROC-FS-1001 determine if the work meets the criteria for Type 3 work, defined as:

Tasks previously analyzed that are considered basic functions applicable to the UCOR work environment and are exempt from the IWCP work planning process. The hazards associated with the task are minor, low risk, and are addressed in general health and safety documents/training. Exempt Work does not require authorization via the Plan of the Day, a Job Hazard Analysis, or a Pre-Evolution Brief. Personnel performing the work shall be briefed on the scope of work, the hazards associated with the scope, and how to control those hazards, and any tools or equipment necessary to complete the task.

If the proposed work passes the screening criteria on these forms, the FM classifies it at the lowest Type 3 hazards level. In some cases where the work may be performed multiple times, UCOR may develop a standard practice procedure.

Work not classified as Type 3 enters the more rigorous work planning process for additional screening and hazard analysis. Type 2 work has two variants: single use and multiple use, for activities that do not require step-by-step instructions and will not require hold points. For work requiring step-by-step instructions, UCOR uses a Type 1 work package (single use) or a Technical Procedure (multiple use). Various SMEs and workers are involved and conduct job walk-downs if the work planner determines that a JHA is necessary.

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 walk-down for a task, the planner includes hold points for SMEs to evaluate the hazards prior to workers proceeding with the job steps involved in that task.

Craft workers are extensively involved in work planning. Because UCOR work planners are not specialists in the type of work they are planning, such as electrical, carpentry, or pipefitting, craft workers are required for job walk-downs and work planning tabletop meetings. Craft workers confirmed their regular participation in work planning tabletop meetings. UCOR uses the experiences of workers and SMEs to create work control packages leading to the safe and successful completion of work.

PROC-FS-1001 outlines the JHA development process. The JHA incorporates and improves upon the traditional OSHA JHA approach. Along with the standard three columns of task, hazard, and control, UCOR has added two additional columns - the type of control (within the hierarchy of controls) and a hazard analysis reference.

As discussed in Management Leadership, the ECF Field Execution Manager has implemented a special hazard analysis project for the Y-12 Biology Complex based on his prior experience at other DOE demolition and cleanup projects. He expects there to be more “pitfalls” that may not have been adequately identified despite extensive efforts to characterize the buildings. Some of the hazards already identified include refrigerants in sensing lines used to control heating and air conditioning systems and sodium/potassium mixtures in instrument sensing lines. Sodium potassium mixtures are known to be potentially pyrophoric and shock sensitive, posing a significant hazard to workers if not properly identified and handled. This special analysis effort includes photographing suspected or uncharacterized items, marking the items with pink paint and bright yellow tags. When possible, UCOR is contacting the original manufacturers for reference information on these items to help identify and analyze the hazards.

In the 2015 assessment, the Team identified that, although UCOR was not documenting D&D workplace weekly site inspections, it was performing daily or more frequent review of the hazardous operations. Supervisors or the LSIT received information about unsafe conditions, and workers commented that issues were usually resolved within days. Although UCOR was not documenting a formal inspection of the D&D sites, it did monitor the construction sites daily and documented issues effectively.

During this onsite evaluation, some conditions indicate UCOR’s routine hazard control/compliance verifications are not achieving the desired results. The DOE-VPP criteria for routine hazard control/compliance verifications involves two separate types of work, continuous operations, and construction activities. The former expects monthly compliance verifications while the latter requires weekly verifications. For D&D activities, participants should apply the construction standard because of the rapidly changing conditions. Further, the criterion expects these workplace compliance verifications “...result in written reports of findings and tracking of hazard control or compliance correction.” UCOR conducts regular workplace compliance verifications of continuous operation workplaces using six different building-specific general operating procedures, as well as other ad hoc methods, such as facility manager walk-downs, and LSIT inspections. However, during workplace visits, the Team observed several areas where housekeeping was poor, signs were illegible or no longer applicable, and conditions existed that compliance verifications should have identified. Similarly, conditions on D&D sites, such as a power cord pinched in a doorway, indicate UCOR’s compliance verifications are not identifying and correcting some hazardous conditions. UCOR should ensure its system of workplace

inspections includes criteria that will remind personnel to look for deteriorating housekeeping and noncompliant conditions, and ensure the frequency and scope of compliance verifications meet the DOE-VPP criteria.

Opportunity for Improvement: UCOR should ensure its system of workplace inspections includes criteria that will remind personnel to look for deteriorating housekeeping and noncompliant conditions, and ensure the frequency and scope of compliance verifications meet the DOE-VPP criteria.

UCOR uses a graded approach for accident and incident investigations. PROC-FO-1063-Rev 4, *Issue Review and Investigation Process*, defines two options for investigations. The first level is a The Rest of the Story (TROT) review. The TROT review is normally a small informal meeting with the work crew and affected personnel to review the facts of the issue. If more formal analysis and investigation is required, UCOR holds a manager meeting, which includes a more detailed investigation of the issue and collection of information to support either an apparent cause analysis or a root cause analysis.

The Team attended a TROT investigation of a hand injury, led by a supervisor. The meeting included many more people than just the work crew and affected personnel. It included more supervisors and middle managers with the managers dominating the meeting. Craft workers provided facts about the incident, and then the meeting relocated to the worksite.

UCOR is revising PROC-FO-1063 to streamline the TROT and manager meeting incident investigation processes, return the TROT review to its original intent, and reduce the number of personnel attending the TROT review. The revision will assign the responsibility to conduct the meeting to a facilitator, replacing the Responsible Manager, thereby introducing more independence and consistency to the process. The facilitator will be responsible for leading the process and directing individuals to prepare personal statements. The facilitator will also evaluate the results of the TROT review to determine if a manager's meeting review is necessary.

UCOR is conducting trend analysis for data accumulated under the health and safety program to identify patterns and systemic issues not perceived when looking at isolated incidents. Management uses the Integrated Safety Management System (ISMS) Performance Objectives, Measures and Commitments (POMC), a high-level management tool focusing on ISMS issues, with two specific injury and illness related data: TRC and DART case rates. The POMC report includes other trend analysis not derived from injury and illness data, but concerning other safety programs. The Injury Free Days Report for Week Ending provides data on first-aid, TRC, description of injury/illness, classification, and cause. UCOR generates trend analysis slides after reports of recurring events that help it identify specific actions that address the trend. The DOE Computerized Accident Incident Reporting System, and the Corrective Action Management System accumulate data, which UCOR uses to establish meaningful trends. UCOR uses the data, which it shares with employees, to develop/modify health and safety goals and objectives.

Conclusion

The UCOR work planning and control system continues to ensure a thorough understanding of hazards that might be encountered during the course of work. Its use of workers and SMEs to

plan work, then identify and analyze hazards, captures the analysis and encourages planners to follow the hierarchy of controls. UCOR is incorporating lessons learned from other DOE and commercial sites to anticipate unusual and unique hazards. Although UCOR is conducting site inspections and walk-downs, it should better coordinate those efforts, develop specific checklists, and document results to avoid complacency in worksite inspections, and help prevent unsafe conditions from developing, particularly in areas where the workforce may have less experience. UCOR meets the Worksite Analysis expectations for continued participation in DOE-VPP.

VI. HAZARD PREVENTION AND CONTROL

The third and fourth core functions of ISM, 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 implementing effective controls (engineered controls, administrative controls, or personal protective equipment (PPE)). The equipment maintenance processes and emergency preparedness plans shall ensure compliance with requirements. The organization shall develop and communicate safety rules and work procedures that all employees understand and follow to prevent, control the frequency of, and reduce the severity of mishaps.

In 2015, UCOR employed the hierarchy of controls to eliminate or mitigate hazards to the workforce. The wellness program, in conjunction with the medical provider, effectively engaged employees to seek out ways to improve their health. UCOR's occupational medicine providers also counseled employees about health or job-related concerns. UCOR was supporting certification of radiological technicians by funding study sessions and testing fees. The emergency management organization, although understaffed, was trying to meet obligations under the DOE Orders and was seeking additional staff to support that effort.

UCOR has fully implemented ISMS, which provides a safe work environment. UCOR has effectively integrated ES&H controls into all levels of work (including planning) through implementation of PROC-FS-1001, *Integrated Work Control Program*.

UCOR uses the results of worksite analysis to eliminate or control hazards. Equipment has been maintained and Personal Protective Equipment (PPE) is available and worn when required to prevent mishaps or control their frequency and/or severity. UCOR has developed, communicated, and implemented safety rules and work procedures, which all personnel understand and follow. Certified professionals are available based on potential risks on the site.

UCOR shared, exhibited, and demonstrated many examples of its use of hierarchy of controls. The following are a few examples of these controls:

Workers were demolishing concrete at the K-25 Slab Remediation Project using an excavator with a hydraulic hammer attachment. They were suppressing dust with water spray from a water truck, but the amount of water needed to suppress the dust made the area too wet to conduct radiological surveys and backfilling. This required pumping the water out of the area, treating the water, and adding additional time for the area to dry before surveying and backfilling. Workers and supervisors devised an engineered control using a flexible curtain made from a vinyl material wrapped around the hammer attachment and kept the dust and concrete pieces entrapped within the curtain. The curtain also reduced the risk to surrounding workers by minimizing chips and fragments flying away from the point of impact, and reduced silica exposure. The workers contacted the equipment manufacturer to verify that the curtain would not interfere with the machine's normal functions. A field test proved this device reduced dust and minimized the need for water dust suppression, which improved production and safety for a nominal investment.

UCOR identified an engineered control for a bridge crane at MSRE using a photo eye to prevent it from contacting another bridge crane. While planning the installation, workers suggested a better location making future maintenance easier and safer. In this case, the photo eye was an engineered control, and workers' input eliminated or reduced additional hazards associated with installation.

Because of flooding from heavy rains last year, the White Oak Creek riprap retaining wall required new metal fencing to hold the material in place. The initial plan required personnel to access the work area across unstable debris. Based on worker suggestions, UCOR revised the work plan to remove debris using an excavator, eliminating the hazard to workers. Workers also placed oil booms across the water as an engineered control for any fluid released from heavy equipment.

Workers had to enter a confined space during demolition of the Clarifier in Building 3608. Rather than entering through the existing access, UCOR cut an access opening in the side of the Clarifier and installed access steps. This allowed safe access to the space and reduced the confined space hazard.

During the installation of new overhead lighting in Building 3608, UCOR identified a potential fall hazard for future maintenance crews. Workers conducting maintenance on the overhead lights in the proximity of the pits would be working on a ladder at heights above the pits' installed guardrails. To eliminate that fall hazard, craft personnel installed the overhead lights on telescoping poles, which workers can lower, allowing access from the ground.

UCOR has implemented required administrative controls across its worksites. It has established barriers and controlled access points for asbestos, radiological contamination, and other hazards that it is abating. Signs, policies, and procedures inform workers of hazards and appropriate controls prior to entering hazardous areas, or prevent entry without proper authorization and training. Workers complete training to recognize hazards and maintain their qualifications to perform the work.

UCOR adopted a nontraditional method for unloading single shipments from flatbed trucks. Workers had been picking the load up from the trailer bed and backing up the fork truck without strapping the load to the fork truck to avoid working on an elevated surface. This led to a few incidents where the load fell off the fork truck tines. To avoid workers having to access an elevated surface and reduce the risk of dropping the load, the fork truck drivers now lift the load a few inches off the flatbed with the fork truck, but leave the fork truck in place while the flatbed trailer is pulled out. The fork truck driver then lowers the load where it can be safely strapped if necessary, and avoids moving the fork truck with an elevated load.

UCOR encourages workers to identify better or additional controls during the course of work. During Plan-of-the-Day (POD), prejob, and prerevolutionary briefs, the Team members observed workers discussing procedures and making suggestions for improvement, which work teams implemented after review. The use of these and other controls, many identified by crafts workers has reduced or eliminated a substantial number of workplace hazards.

UCOR has an extensive heat stress management program. Program elements include employee training, engineering controls, administrative controls, cooling devices, medical screening (identification of concerns related to heat tolerance and medications), and heat stress monitoring. UCOR is also in the early stages of evaluating advanced physiological monitoring capabilities that overcome the limitations of its current systems (e.g., transmission of heart rate and temperature data over radio links in systems used by firefighters). The need to address heat stress monitoring was evident as the Team noticed differences in procedures based on facility, availability of industrial hygienists, and preferred method depending on the work plan and supervisor.

At some locations, UCOR is using real-time metabolic monitoring for heat stress monitoring. The system uses an iPad with wireless monitoring. Instead of an IH technician monitoring the system, a worker on the crew monitors the iPad during work. Some workers interviewed believe this duty is better suited to a trained IH technician, and some workers are uncomfortable with the extra monitoring responsibility.

At the Biology Building, the Safety and Health Operations Manager has stopped using the iPad wireless monitoring system for heat stress management after connectivity issues arose and instituted a manual logging process, manually recording each worker's heart rate at 15-minute intervals. This practice is not identified in PROC-IH-5134, *Temperature Extremes*, which identifies limits on heart rate and actions to take when a heart rate exceeds limits.

The Safety and Health Operations Manager did not put in place any processes, such as logs or monitoring by IH technicians that could monitor and account for data connection loss. He also did not perform any parallel testing of the two methods to determine which process is more reliable and, consequently, may not be achieving the increased safety margins associated with real-time heart rate monitoring for heat stress control. The 15-minute logging approach could put a worker at risk of heat stress in the 15-minute interval between heart rate checks, or even longer if workers do not collect timely data. UCOR expects workers to monitor their heart rate frequently, but the 15-minute logging practice might actually reduce the frequency that workers are checking their heart rate.

UCOR should run parallel tests between the proven iPad technology and the 15-minute data logging practice to determine which process provides the most reliable protection for workers. UCOR should also validate whether the 15-minute interval recording method meets the intent of the American Conference of Governmental Industrial Hygienists (ACGIH) recommendations for physiological monitoring when Wet-Bulb Globe Temperature work/rest regimens require extensions. UCOR should revise procedure PROC-IH-5134 to be consistent with the practices in the field once validated. UCOR IH should enlist the assistance of the iPad/Chest Monitoring vendor to determine if the connectivity interferences could improve with Wi-Fi repeaters or Bluetooth enhancements.

Opportunity for Improvement: UCOR should consider comparison tests between the real-time heart rate monitoring system and 15-minute data logging practices, validate its heat stress monitoring practices meet ACGIH recommendations, seek assistance from the heart rate monitoring system vendor, and revise its heat stress monitoring procedure based on those actions.

UCOR employs certified industrial hygienists, certified safety professionals, safety engineers, fire protection engineers, certified occupational physicians, certified occupational nurses, and other certified professionals and strongly supports the maintenance of these certifications. UCOR pays for precertification test training classes, certification fees, post certification, and continuation of education training to maintain certifications (See Employee Involvement).

UCOR effectively uses PPE to protect workers. The Team observed extensive use of PPE, such as reflective vests, gloves, eye protection, and hearing protection. UCOR provides prescription safety eyewear where needed. The Team observed workers wearing the appropriate PPE. UCOR uses the correct arc-flash equipment for electrical work, and in most places has the appropriate arc-flash labeling in place on electrical equipment. UCOR is currently transitioning its electrical safety program requirements to the newer 2018 version of the National Fire

Protection Association's 70E, *Standard for Electrical Safety in the Workplace*, the source document for electrical PPE.

The City of Oak Ridge provides fire department services at ETTP and has a Memorandum of Agreement between DOE and the City of Oak Ridge. This memorandum delineates the fire support to ETTP and the interface between the fire department and emergency response at the ETTP site. UCOR also coordinates/integrates emergency planning among the contractors, DOE, and the National Nuclear Security Administration at all the Oak Ridge sites through the Emergency Management Council, which meets quarterly. UCOR also coordinates the Annual Full Participation Exercise, which includes the local city and county, and rotates among ETTP, ORNL, and Y-12.

The UCOR Emergency Preparedness Program, documented in PPD-EP-3023, *Emergency Management Organization Program Description*, implements the DOE requirements in DOE Order 151.1C, *Comprehensive Emergency Management System*, and DOE Guide 151.1-1A, *Emergency Management Fundamentals and the Operational Base Program*. During an AECOM corporate assessment last year, UCOR discovered it had not implemented a High-Hazard Facility-Level drill program as required. UCOR has since implemented a corrective action plan to conduct facility-level drills (UCOR Operations Emergency Drill Procedure) at all its operational facilities at all three sites (ORNL, Y-12, and ETTP). UCOR recently completed a follow-up management assessment, which gave high marks for the implementation of the corrective actions to implement this Facility-Level Drill program.

UCOR has implemented effective emergency communications to its employees. Recently, UCOR demonstrated how it communicates emergency information via text messaging and email when it notified supervisors and workers to take shelter because of nearby lightning strikes.

UCOR's discipline program, documented in POL-HR-309, *Progressive Discipline*, defines the roles and responsibilities to ensure fair and consistent administration of discipline for UCOR nonrepresented and represented employees. The policy, in conjunction with the Employee Standards of Conduct, defines the role of the employee, the direct supervisor, and FM. It delineates the process to conduct and document work-related performance issues and/or behaviors warranting corrective and disciplinary actions. Workers interviewed felt the discipline process is fair and administered equitably.

UCOR contracts occupational medical services. One full-time physician (corporate physician) is onsite one week per month. In addition, two nurse practitioners, three registered nurses, five administrative staff (one is an information technology specialist), and one laboratory technician are available full time. One nurse practitioner is available part time (weekend/holidays), and one medical services staff member is on-call 24/7. The medical program, includes timely access to the services of licensed physicians required by applicable Federal and/or State regulations. Medical staff and selected personnel receive training in Cardio Pulmonary Resuscitation, first aid, and use of Automated External Defibrillators. The medical staff is available to all persons working in contractor-controlled spaces during all work periods, including overtime. The clinic provides basic life support, first-aid, and emergency and lifesaving care. If necessary, the clinic arranges transportation to the nearest hospital (Methodist Medical Center). Emergency Medical Technicians and first responders are available throughout the site.

Medical records of onsite personnel are clear and complete. Case management accounts for patient status from time of initial visit, corrective referral until the worker's restoration to full

duty on the job, or the worker leaves the organization. The medical clinic initiates the UCOR Form 411 (notification of a clinic visit due to injury/illness report equivalent to OSHA Form 301), which electronically notifies the supervisor and case management. The medical services follow standardized protocols. Medical staff work with the Risk Department/Legal and UCOR's worker compensation insurance company adjuster and have a robust return-to-work protocol. They stay involved with patients under medical care and work with the employee, nurse practitioner, managers, supervisors, safety representatives, and the ES&H manager.

The Occupational Medicine Department provides a full range of medical examinations (e.g., physical surveillance, asbestos, mercury, lead, radiation, HAZWOPER, Department of Transportation, silica). They provide respirator examinations and fit testing, audiology, pulmonary function tests, urinalysis, and drug testing (post-accident, random, and for cause) services. Medical staff are proactive and initiate the examination process by scheduling appointments rather than waiting for employees to request appointments. UCOR provides a van to transport employees from their work area to the clinic.

Medical personnel have been involved in job and process safety analysis, comprehensive surveys, early recognition, and treatment of illness and injury and in limiting the severity of harm, and accident/incident investigations as needed within the last 12 months. They perform trend analysis on the reasons for medical visits, which provides data to establish patterns or trends. The corporate physician meets weekly with the ES&H and project managers to discuss issues, trends, and changes. The medical program meets all requirements and is extremely effective.

Since the 2015 onsite VPP evaluation, UCOR has made significant improvements in its Wellness Program to help it maintain a healthy workforce. Wellness Program elements include encouraging healthy habits, increasing awareness of factors and resources contributing to well-being, inspiring and empowering individuals to take responsibility for their own health, and promoting and supporting the culture of a wellness community. The Wellness Program Manager developed a Yearly Health and Wellness Plan projecting various events planned for each month. UCOR communicates these events throughout the reservation through the Newslines (UCOR's monthly newsletter), word-of-mouth from the Safety Advocates and Wellness Committee members, information kiosks throughout the site, "Wellness Spotlight" e-mails, and Monthly Safety Focus meetings.

UCOR established a Wellness Committee to identify and select programs. Programs may be UCOR only or in coordination/support of community stewardship. The June 2019 program featured an "Opioid Awareness Campaign" and "Operation Medicine Cabinet" where UCOR collaborated with the Oak Ridge Police Department and Allies for Substance Abuse Prevention of Anderson County. UCOR hosted the event, encouraging employees to bring in expired or unused prescriptions to reduce drug abuse and practice responsible stewardship toward the environment.

Managers recognize the benefits of the Wellness Program. The program manager has proven, through fun and innovative initiatives that the UCOR Wellness Program continues to have a positive impact on the lives of UCOR employees/managers, their families, and the community. In addition to these initiatives, UCOR regularly participates in quarterly blood drives, stretch and flex, special challenges, Wellness Festivals, wellness-related clubs (e.g., biking, bowling, hiking, and softball), and Working-on-Wellness lunch and learn sessions.

Occupational health professionals complete ergonomic surveys, and UCOR makes improvements where needed. UCOR purchases ergonomic Sit/Stand stations and chairs as needed/identified for employees. UCOR is participating in an ergonomic pilot program, WorkCare, with three specific goals:

1. Identify risk factors before symptoms
2. Identify symptoms before injury, and
3. Decrease morbidity/disability from injury.

WorkCare reviews the current stretch and flex program with the intent to build industrial athletes by using Biomechanical Coaching, a process where employees wear Ergo Wellness Suits, are filmed performing work tasks, and record data transmitted from the ergo suits.

Conclusion

UCOR takes the health and welfare of its staff, staff augments, and contractor workforce seriously. They effectively control hazards using the hierarchy of controls. UCOR involves workers in work planning and package development to leverage workers' understanding of hazards and their experience controlling those hazards. Managers and supervisors seek and respect the workers' opinions and ideas before finalizing work packages or implementing solutions. UCOR provides a full range of medical services, emergency response and planning, and wellness program support. UCOR's injury and illness rates are well below the rates of comparative industry average and reflect effective hazard prevention and control methods. 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 shall know and understand the policies, rules, and procedures established to prevent exposure to hazards. Training for health and safety shall ensure that personnel understand their responsibilities, recognize hazards they may encounter, and are capable of acting in accordance with management expectations and approved procedures..

In 2015, UCOR provided training to workers to ensure they were proficient in their jobs and recognized hazards of different work areas. The majority of training occurred in classrooms and required demonstration of skills on mockups and tests. UCOR had an effective program to verify the worker was current in his/her training prior to letting them work. Managers recognized the need to improve training for supervisors and purchased a new software package to help train the soft skills.

UCOR provides workers with the training, knowledge, and skills to perform their jobs safely. Training requirements derive from DOE regulations and Orders, OSHA regulations, State regulations, and UCOR policies and procedures. Required training for most workers, in addition to basic safety and ETPP Park Worker training, includes: radiological worker, confined-space entry, HAZWOPER, nuclear criticality safety, respirator, and asbestos. Approximately 50 percent of required training is classroom training, and the remainder is computer-based training (CBT). CBT courses include internal assessments and tests requiring a passing score of 80 percent to receive credit.

Every UCOR employee has a position assignment form (PAF) in the Local Education Administrative Requirements Network (LEARN) database. The LEARN system is UCOR's electronic training management system. The PAF includes the position assignment, training position description (TPD), qualification cards, and individual requirements. TPDs state the mandatory UCOR training required for employees. The Team evaluated a sample of employee training for the OOCE and verified the training curriculum addressed identified requirements. When project scopes change or new work arises, the training organization works with ES&H SMEs to update or develop new training material to ensure the training identifies the hazards. The training staff and SMEs review all training material (classroom and CBT) for accuracy and content every 2 years for nuclear facility-specific training and every 3 years for all other training. UCOR uses four types of TPDs:

1. Company TPDs (hourly or UCOR company employees) establish mandatory training for all UCOR employees.
2. Access TPDs capture the site access training for each of UCOR work areas.
3. Functional TPDs capture the roles, responsibilities, and required training for functional positions.
4. Project TPDs capture the roles, responsibilities, and required training that are unique to the project positions and different from those established by functional TPDs.

UCOR assesses all personnel and assigns an appropriate combination of these TPDs that establish an individual's training and qualification requirements. The Team evaluated the work planner's TPD qualifications. The TPDs demonstrated a rigorous qualification program that includes a formal training checklist, on-the-job training, and an oral board to ensure work planners understand their responsibilities.

UCOR has training points-of-contact (TPOC) who work with the UCOR central training group 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 e-mail reminder to both the individual and his or her first line supervisor. The TPOCs work with the supervisor to schedule training for their workgroups and can individualize LEARN to send training messages more often at the supervisor's request.

Each employee has a Training Access Card (TAC), which identifies his or her qualifications. One side of the TAC lists the employee's name, ID number, and shows the next ES&H training due date. The TPOC signs the card. Personnel routinely check these cards as part of meetings, LSIT, or POD gatherings to ensure their qualifications are up-to-date. The reverse side of the TAC card displays the ISMS core functions and the eight guiding principles.

Managers and supervisors ensure workers complete training before performing assigned work. Supervisors verify training and qualifications in POD meetings and when reviewing Safety Task Analysis Risk Reduction Talk (STARRT) cards. STARRT card reviews require supervisors to validate workers' training is current on the TAC. The Team observed workers and supervisors checking the TACs during PODs, prejob, and preevolution briefs prior to entering controlled areas and at respirator issue points.

The UCOR Training Review Committee helps the training organization identify training issues and recommended changes to senior staff. The Training Review Committee includes selected senior UCOR managers and training organization representatives. One improvement suggested by the training group was modifying Criticality Safety and Radiation Worker core training. Previously, all workers had to sit through the classroom training, which was inefficient for experienced workers. The training group suggested revising the training to require "first time workers" in Criticality Safety and Radiation Worker Core training take classroom courses, but allow experienced workers to use the CBT course (as a refresher). The Training Review Committee provided an independent review of this suggestion, agreed with this approach, and UCOR implemented the change.

UCOR projects perform block training twice a year when applicable. UCOR projects try to schedule block training during inclement winter weather and during the heat of the summer months to take advantage of work slowdown or heat stress concerns. For example, in 2019 ETPP D&D activities have scheduled block training to occur during the last week of July and the first week of August. This approach helps protect workers from extreme temperatures and inclement weather hazards, and ensures required training does not conflict with project work goals.

UCOR has developed the UCOR University training program to promote employees' professional development. The UCOR University training courses are available online for free to all UCOR employees. Courses include project management certification, Microsoft® certification, and many other opportunities.

UCOR has implemented virtual reality (VR)-based training in support of all project work. The training includes simulator training for boom lifts, rough terrain scissor lifts, and scissor lift training. The simulator training includes up to 16 modules for each piece of equipment and realistically simulates various conditions the equipment operator could experience in real life. The training program includes the use of a hydraulically supported basket that provides new

users realistic “physical and visual” feedback from VR interaction. The VR-based training provides an excellent simulation of conditions and hazards operators might encounter.

The Team observed a demonstration of several VR modules for the boom lift and scissor lift. The feedback was realistic and the system ensured that trainees performed crucial steps, such as visually checking their surroundings prior to initiating actions. The training program evaluates the actions and provides a score at the end of each module. The VR-based system provides a realistic training experience without exposure to real hazards. Though the simulator is physically located at ETPP, classes are open enrollment and available to all workers requiring this qualification or requalification. UCOR should encourage more workers from its other D&D worksites to use the VR training at ETPP as part of the workers’ qualification and requalification process.

Opportunity for Improvement: UCOR should encourage more workers from its other D&D worksites to use the VR training at ETPP as part of the workers’ qualification and requalification process.

UCOR continues to support participation in the Board of Certified Safety Professionals (BCSP) Safety-Trained Supervisor (STS) program and UCOR pays for the associated fees for its employees that seek those certifications. UCOR currently has 196 Safety Trained Supervisor/Safety Trained Supervisor Construction certified individuals, and expects all employees in supervisory positions to complete the certification. UCOR has expanded its efforts to promote employee certification for the OSHO program. The OSHO program provides exam preparation and training support for successful completion of the certification.

Conclusion

UCOR provides workers with the training, knowledge, and skills to perform their jobs safely. UCOR develops appropriate training for each worker. UCOR continues to support participation in the BCSP STS, and OSHO programs by paying the associated fees. UCOR meets the expectations for the Safety and Health Training tenet for a DOE-VPP participant.

VIII. CONCLUSIONS

Since 2015, UCOR has continued its approach and established a strong working partnership between the company and its workforce. Safety on the jobsite is an all-encompassing value for managers and workers alike. The combination of experience from other DOE sites and local knowledge of the site history creates a strong safety culture resulting in effective contract performance. The atmosphere created by UCOR at the jobsites is allowing UCOR to further accelerate cleanup at the Oak Ridge reservation, protect the environment, and establish a safer working environment for any following cleanup contracts. Cost savings from the cleanup mission have allowed DOE to implement additional cleanup work and infrastructure improvements, which, in turn, helps the other contractors at the Oak Ridge Reservation reliably perform their mission. UCOR's involvement in the community and promotion of entry level labor through its union partners is helping change the workforce culture beyond UCOR's specific projects. 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. The Team recommends UCOR continue to participate in DOE-VPP at the Star level.

Appendix A: Onsite VPP Assessment Team Roster

Management

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