Mission Support Alliance, LLC Volpentest Hazardous Materials Management and Emergency Response (HAMMER) Federal Training Center

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
November 6-9, 2017

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 steppingstone 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 their letterheads and/or on award items for employee incentive programs.

This report summarizes the results of DOE-VPP evaluation of Mission Support Alliance, LLC, Volpentest Hazardous Materials Management and Emergency Response (HAMMER) Federal Training Center conducted November 6-9, 2017, and provides the Associate Under Secretary for Environment, Health, Safety and Security with the necessary information to make the final decision regarding HAMMER's continued participation in DOE-VPP.

Table of Contents

ABBREVIATIONS AND ACRONYMS

AU	Office of Environment, Health, Safety and Security
AU-12	Office of Worker Safety and Health Assistance
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CHPRC	CH2M HILL Plateau Remediation Company, Inc.
CSHA	Craft-Specific Hazard Analysis
CUA	Chemical Use Attachment
DART	Days Away, Restricted or Transferred
DOE	Department of Energy
EJTA	Employee Job Task Analysis
ELM	Electronic Learning Management
EP	Emergency Preparedness
EZAC	Employee Zero Accident Council
FERO	Facility Emergency Response Organization
GHA	General Hazard Analysis
HAMMER	Volpentest Hazardous Materials Management and Emergency Response Federal Training Center
HAMTC	Hanford Atomic Metal Trades Council
HAZWOPER	Hazardous Waste Operations and Emergency Response
HGET	Hanford General Employee Training
HITS	Hanford Integrated Training System
HPMC	HPM Corporation
IH	Industrial Hygiene
IHT	Industrial Hygiene Technician
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
MSA	Mission Support Alliance, LLC
MSC	Mission Support Contract
NAICS	North American Industry Classification System
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
SIP	Safety Improvement Plan
STEM	Science, Technology, Engineering and Math
Team	Office of Environment, Health, Safety and Security DOE-VPP Team
TRC	Total Recordable Case
VPP	Voluntary Protection Program
WRPS	Washington River Protection Solutions, LLC

EXECUTIVE SUMMARY

The Department of Energy's (DOE) Voluntary Protection Program (VPP) Team (Team) from the Office of Environment, Health, Safety and Security (AU) recommends that the Volpentest Hazardous Materials Management and Emergency Response (HAMMER) Federal Training Center continue participating in DOE-VPP as a Star site. The Team conducted the triennial review of HAMMER Federal Training Center from November 6–9, 2017; and this report documents the Team's observations, conclusions, and identifies several opportunities for improvement that HAMMER can consider in its pursuit of excellence in worker safety and health. This triennial assessment also provides a review of HAMMER's safety programs for its continued participation in DOE-VPP.

Mission Support Alliance, LLC (MSA) currently manages the HAMMER Federal Training Center, which initially entered the DOE-VPP as a Star site in 2002. In 2005, it was recertified as a DOE-VPP Star site. Fluor Hanford operated HAMMER until August 2009 when the HAMMER workscope was placed in the Mission Support Contract (MSC) and awarded to MSA. Following the completion of the DOE-VPP transitional process, HAMMER was again recertified as a Star site in 2011 and 2014.

Injury rates for HAMMER staff for the past 3 years are 100 percent below the rates for the comparison industry of educational services. HAMMER subcontractors added 63,604 hours to the 3-year total without an injury or lost workday. As of this review, HAMMER has not incurred any recordable injuries for 2017.

Managers at HAMMER support continued safety improvements. They collaborated with employees to establish improvement goals and provided workers with the resources to accomplish those goals. Managers support Employee Zero Accident Council (EZAC) participation and encourage worker involvement. HAMMER continues to reach out and recruit new talent to accomplish its core mission and provide training that is "as real as it gets." HAMMER demonstrates the Management Leadership expectations for continued participation in DOE-VPP.

The EZAC continues to be the primary method for employee involvement in safety at HAMMER. Based on an opportunity for improvement in the 2014 report, HAMMER revised the EZAC charter to reflect roles and responsibilities of the chairs. In addition, the EZAC has been more involved in addressing broader site concerns. Clear and open communications between managers and employees was evident during the review. HAMMER continues to apply multiple methods to recognize and award worker achievements promoting a safe work environment and the Team observed several examples of those methods in action.

Hazards at the HAMMER facility are effectively analyzed. Employees actively inspect worksites for new hazards or degrading conditions and corrective actions are tracked to closure. Training hazard analysis processes are well developed to ensure students are provided a safe and healthful training environment.

HAMMER continues to have effective processes that ensure hazards are adequately controlled. The use of hierarchy of controls; i.e., the use of substitution, engineered controls, then administrative controls or personal protective equipment (PPE), was evident across the facility.

HAMMER's safety training program provides training for workers, supervisors, and managers to ensure they fully understand the hazards and controls within their work areas. Because of HAMMER's mission, the HAMMER staff is among the most knowledgeable and best trained personnel at the Hanford site. HAMMER developed the Hanford Integrated Training System (HITS) to reduce training system inefficiencies across the Hanford site, as well as a centralized Industrial Hygiene Technician (IHT) training program for Hanford contractors CH2M HILL Plateau Remediation Company, Inc. (CHPRC), Washington River Protection Solutions, LLC (WRPS), and MSA to address deficiencies identified in several independent industrial hygiene (IH) evaluations.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
MSA should consider sharing the HITS program at the Region X and/or the Voluntary Protection Programs Participants' Association Inc. National conference to demonstrate its unique approach to improving the training process and increase efficiency.	18

I. INTRODUCTION

The Hanford site's HAMMER Federal Training Center began in 1986 as a community-based initiative to improve training for hazardous materials workers, emergency responders, and firefighters in the tri-cities area of Washington (Richland, Kennewick, and Pasco) adjacent to DOE's Hanford site. The Tri-County Fire Commissioners, the Benton-Franklin Regional Council, and local labor councils developed the concept. The Tri-Cities Development Council's Executive Vice President, Sam Volpentest, convinced Congress and DOE that Hanford site workers and emergency responders needed hands-on training to protect the lives of workers and the surrounding communities. In 1994, Congress appropriated funds to begin operations in a temporary facility and initiated the construction of HAMMER. Upon completion of construction in September 1997, HAMMER was officially dedicated.

Mission Support Alliance, LLC (MSA) currently manages the HAMMER Federal Training Center, which initially entered the DOE-VPP as a Star site in 2002. In 2005, it was recertified as a DOE-VPP Star site. Fluor Hanford operated HAMMER until August 2009 when the HAMMER workscope was placed in the Mission Support Contract (MSC) and awarded to MSA. Following the completion of the DOE-VPP transitional process, it was again recertified as a Star site in 2011 and 2014.

Located in Richland, Washington, HAMMER is integral in preparing workers and emergency responders for high-risk tasks and the use of new technologies at DOE's Hanford site and customers from other local, State, and Federal Agencies. HAMMER includes an 88-acre core campus, which provides training that includes the hands-on use of realistic props and settings intended to save lives, reduce injuries, and increase worker productivity. HAMMER helps users identify training needs and develop courses and training methods, provides professional instructors and classroom space, and operates and maintains the training props. Workers/trainers from other site contractors lead and instruct many specialized classes. Staffed by approximately 100 people, including professional trainers, administrative support, technicians, and skilled crafts, HAMMER provides the initial and recurring training for all Hanford site personnel on standard site programs. This includes Hanford General Employee Training (HGET), Radiological Worker I and II, Radiological Controls Technician, Hazardous Waste Operations and Emergency Response (HAZWOPER), Lockout/Tagout, Beryllium Awareness, and Respiratory Protection. HAMMER provides a large variety of additional training topics, such as fall protection, confined-space entry, electrical safety, load securement, and hoisting and rigging. Finally, HAMMER allows a wide range of firefighting, law enforcement, national security, and defense organizations to use HAMMER facilities for specialized training activities.

HAMMER includes the following props and facilities:

- Above Ground Pipeline Props;
- Burn Building;
- Confined Space Prop;
- Crane and Rigging Pad;
- Dumpster Burn Prop;
- Emergency Vehicle Operations Course;
- Fall Protection Prop;

- Flammable Liquid Burn Pad;
- Hazardous Material (HAZMAT) Pad;
- Liquid Petroleum Gas Burn Pad;
- Native American Cultural Site;
- Pond and Stream;
- Port of Entry Prop;
- Rail Tank Cars Prop;
- Railcar/Tanker/Truck Burn Pad;
- Search and Rescue Building;
- Six-Story Training Tower;
- Storage Tanks Prop;
- Structural Collapse Prop;
- Trench Prop;
- Vehicle Burn Prop; and
- Waste Tank Prop.

There are 16 buildings on the HAMMER campus for classroom, hands-on training and administrative use. HAMMER's administration building is the largest building and includes ten classrooms, the Hanford Safety Resource Library, two computer-based training rooms, a distance learning (video teleconferencing) center, administrative offices, and a restaurant. The Al Alm Building is the second largest building. It comprises an 11,000 square-foot open bay with 20-foot ceilings, a large vehicle bay, six classrooms, and numerous practical training areas. The Volpentest Annex Building houses the radiological safety training classrooms, and practical training areas. The Al Alm Annex includes two classrooms and two practical training areas.

The Team conducted this triennial recertification assessment from November 6-9, 2017. The assessment included observation of training classes, interviews with managers and staff, a review of procedures, and inspection of facilities.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Table 2.1 Injury Incidence/Lost Workdays Case Rate (HAMMER)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Rate(cases per 200,000 hours	Days Away, Restricted or Transferred (DART) Cases	DART Case Rate
2014	173,801	0	0	0	0
2015	211,703	0	0	0	0
2016	234,256	0	0	0	0
2017**	199,966	0	0	0	0
3-Year Total (2014-2016)	619,760	0	0	0	0
Bureau of Labor Statistics (BLS-2016) average for NAICS* # 611 Educational Services			2.0		0.9

Table 2.2 Injury Incidence / Lost Workdays Case Rate (Subcontractor)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART Cases	DART Case Rate
2014	23,463	0	0	0	0
2015	19,936	0	0	0	0
2016	20,205	0	0	0	0
2017**	15,357	0	0	0	0
3-Year Average (2014 – 2016)	63,604	0	0	0	0
Bureau of Labor Statistics (BLS-2016) average for NAICS* #611 Educational Services			2.0		0.9

* North American Industry Classification System
** Part calendar year data: January to October

TRC Incidence Rate, including subcontractors: 0.00
DART Rate, including subcontractors: 0.00

Conclusion

Injury rates for HAMMER staff for the past 3 years are 100 percent below the rates for the comparison industry of educational services. HAMMER subcontractors added 63,604 hours to the 3-year total without an injury or lost workday. As of this review, HAMMER has not incurred any recordable injuries for 2017.

III. MANAGEMENT LEADERSHIP

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

The 2014 VPP review observed that managers at HAMMER fully supported continued safety improvements and provided workers with the resources to accomplish that goal. Managers ensured the HAMMER mission of providing safe, quality training that is "*as real as it gets"* was accomplished. Managers supported training divisions with technical assistance, acquisition of training aids, and encouraged innovative training scenarios to provide a realistic training environment.

Management support for the employee safety committee (EZAC) and overall worker involvement was clearly visible (see Employee Involvement). Managers understood that supporting employee involvement, providing resources to the EZAC, and attending EZAC meetings was essential to retaining workers' trust.

The Team determined that managers at HAMMER regularly interact with the workforce throughout the facility. In the two previous onsite evaluations, discussions with senior managers indicated that they were open to employee concerns, ideas, and suggestions. Senior managers have increased their commitment to the VPP process since the last review. One example of this commitment is the *Monday Morning Safety Start.* Senior managers and EZAC team members led a meeting that the Team attended. Without hesitation, workers enthusiastically participated in the "Safety 24/7" presentations, a part of the *Monday Morning Safety Start* where employees share safety topics related to after-hours situations (See Employee Involvement).

Division managers interact with workers in many areas of the facility. Since the HAMMER staff is relatively small, frequent interaction among the staff, supervisors, and senior managers is common. This interaction has continued to improve since the 2014 report. In 2014, the HAMMER Director was not getting into the workplace as much as she desired. The HAMMER Director and other managers now regularly visit classrooms and other workspaces, interacting with workers, and supporting the safety program by their presence and direct involvement. In addition, the Director has begun meeting with staff members on a regular basis. Meetings where staff members can communicate issues and concerns to the Director include the *Senior Program Manager's Meeting*, *Quarterly Instructor's Meeting*, and the *Next Generation Meeting*. Each meeting allows different groups the opportunity to discuss issues with the Director, other managers, and to synergize with their peers. Because of these efforts to engage and communicate with the workforce, trust and respect between managers and employees has improved further since 2014.

The 2014 report identified an opportunity for HAMMER to improve methods to attract and retain qualified safety professionals. While unplanned attrition is still occurring, HAMMER has teamed with other Hanford site companies, local colleges, high schools, and municipalities to form the Future Workforce Subcommittee (subcommittee reporting to the HAMMER/Hanford Training Board of Directors). The group is a collaborative think tank whose goal is to identify methods to introduce and educate students and outside talent about opportunities at the Hanford site and to develop methods to recruit them. However, the Future Workforce Subcommittee, formed prior to 2016, stopped meeting. The HAMMER management reconvened the subcommittee in mid-2017 and drafted a charter. The subcommittee is baselining ideas to attract new, early career workers to the Hanford site. HAMMER hopes to use ideas generated by this group, such as teaming with local schools with outreach programs, and job fairs that will inform and educate local students about opportunities at HAMMER and at the Hanford site.

MSA is also working to address employee attrition. MSA created its *Synergy Network*. *Synergy Network* is an open network that provides a forum for MSA female employees to build connections and use resources for professional growth and development. MSA employees hosted a "Planting the Seeds for STEM" in July 2017, and shared their career experiences as women in Science, Technology, Engineering and Math (STEM) with other MSA employees and students.

The previously mentioned *Next Generation Meeting* is a similar effort. The *Next Generation Meeting* seeks to prepare the younger and newer staff members to embrace HAMMER's mission for saving lives and averting disasters, and to commit to driving HAMMER's legacy far into the future. This meeting encourages employee growth, aids in improving employee job satisfaction, and helps address employee retention concerns.

These collective initiatives have made some progress, but competition for talent between Hanford and outside companies, as well as municipalities with higher pay and better benefits, remains a challenge for HAMMER. HAMMER should continue using all of these methods to attract and retain workers.

HAMMER has one full-time, certified safety professional. Additional professional safety and health support is available from other MSA organizations. Interviews with work planners and craft workers indicate that the availability of safety support has not posed a problem. Work planners and craft workers at HAMMER can request safety support from MSA when needed.

As was the case in the 2011 and 2014 VPP assessments, HAMMER continues to rely on VPP gap analysis surveys that gather data through worker interviews and trimester surveys augmented with work observations by managers or subject matter experts. These efforts provide improved input into the safety improvement plans (SIP).

In 2014, the Team recommended that HAMMER should develop challenging, achievable safety goals to improve its safety culture. The Team compared the 2014 and 2017 SIPs. HAMMER has established measurable and objective goals to drive continuous safety improvement, including goals for each VPP tenet. For example, one of the management leadership goals in the SIP recommended the Director use the previously discussed meetings as an opportunity to encourage greater interaction with staff. A SIP goal to support employee involvement includes encouraging participation in the Performance Incentive Program. HAMMER encourages every

full-time employee to participate in at least one Quarterly Safety Inspection during the calendar year.

The worksite analysis and hazard prevention and control goals focused on traffic and pedestrian safety, injury and illness statistics awareness, providing additional training to all HAMMER staff on the hazard analysis process, and worker rights and responsibilities information from title 10, Code of Federal Regulations, part 851, (10 CFR 851), *Worker Safety and Health Program.* The safety and health training goal established a HAMMER Safety Focus Day where all workers attended four different sessions on topics that included: "The Rad Factor," "Toward a Healthy Safety Culture," "Tank Farms: History and Mission," and "Sustaining and Maintaining VPP STAR is Not a Simple Task." The Safety Focus Day reaffirmed HAMMER managers' commitment to safety, provided workers with additional safety training, and sent a message that safety is a core value at HAMMER. The improved process established goals for each VPP tenet, assigned those goals to responsible managers, and then tracked progress throughout the year to drive continuous improvement.

Conclusion

Managers at HAMMER support continued safety improvements. They collaborated with employees to establish improvement goals and provided workers with the resources to accomplish those goals. Managers support EZAC participation and encourage worker involvement. HAMMER continues to reach out and recruit new talent to accomplish its core mission and provide "*as real as it gets"* training. HAMMER demonstrates the Management Leadership expectations for continued participation in DOE-VPP.

IV. EMPLOYEE INVOLVEMENT

Employee involvement is a major pillar of a strong safety culture. Employees at all levels must continue to be involved in structuring and operating the safety and health program and in decision making that affects employee health and safety. Employee participation is in addition to the right to notify 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 is welcome. Managers must be proactive in recognizing and rewarding workers for their participation and contributions. Employees and managers must communicate and collaborate in open forums to discuss continuing improvements, to recognize and resolve issues, and to learn from their experiences.

The 2014 review determined that employee involvement at the HAMMER facility was excellent. Clear and open communications between managers and employees was evident during the review. HAMMER provided programs that gave employees the opportunity to improve safe work practices across the facility. HAMMER maintained a reward program to recognize employees for their involvement in promoting a safe work environment.

The EZAC continues to be the primary method for employee involvement. The EZAC meetings occur monthly to share lessons learned, discuss health and safety goals, address and track safety issues, and recognize safety accomplishments. Meetings include managers, bargaining unit employees, exempt and nonexempt employees, and subcontractors. A volunteer staff member who may be a member of the bargaining unit chairs or co-chairs the EZAC. MSA encourages each workgroup (organizational elements such as HR, training, work control, etc.,) to send representatives to EZAC, then prepares and distributes meeting minutes of the EZAC meetings, to all HAMMER staff.

The 2014 Team identified that the EZAC charter was out of date and did not reflect the current roles and responsibilities for the chair and co-chair. The 2014 onsite evaluation also identified that while the EZAC continued to be an asset to the employee involvement element at HAMMER, there was an opportunity for the EZAC to become even more valuable to the safety program if senior managers would ask the EZAC to address facility-wide concerns. In response to those recommendations, HAMMER revised the EZAC charter to reflect roles and responsibilities of the chairs. In addition, the EZAC has been more involved in addressing broader site concerns. HAMMER provided the Team with several examples of improved EZAC responsibility, including improvements to the site's vehicle safety initiatives, such as the removable speed bumps and illuminated crosswalk signs. HAMMER also tasked the EZAC with improving worker awareness of the general hazard analysis (GHA) and the training hazard analysis process, and developing presentations to encourage employees to voice safety concerns.

The Team attended an EZAC meeting during the review. The EZAC chair introduced the Team members and discussed the purpose of the Team's visit to the attendees. Nearly 50 employees from various MSA/HAMMER worker organizations attended the EZAC meeting. The EZAC chair led the meeting with a review of the President's Zero Action Council meeting notes and a safety share discussion. He also discussed newly submitted safety log book issues and covered the safety log issues recently closed.

The chair then divided attendees into groups of five people, gave them various emergency preparedness scenarios (desktop drill scenarios), and asked them "*What ya' gonna do?*" After completing their reviews, each group discussed their responses and compared them to the emergency preparedness procedures. Participants were very enthusiastic and had detailed discussions about the scenarios. Several of the groups replied that their responses were correct, but in some cases, were contrary to the emergency preparedness procedures. While the exercise conducted by the EZAC was successful, with considerable input from the attendees, the EZAC chair missed an opportunity to follow up with the groups that identified "errors" (in their opinion) to the procedures and should have captured those suggestions for review by the Emergency Preparedness (EP) group for possible improvement.

Safety Log Books are log books maintained by the EZAC leadership and located throughout the facilities that employees may use to raise potential safety concerns or issues in writing. HAMMER includes descriptions of the closed issues in the safety logbooks for additional review by submitters. The Safety Log Book Procedure, *MSC-GD-50606 (rev.1)*, establishes locations for the safety logbooks in common areas, such as the main lobby for easy access by visitors and employees. The Team observed that the HAMMER EZAC committee has located safety logbooks in the cafeteria and in the Al Alm Building (Building #6092) break room. However, The EZAC committee had not provided signs identifying the locations of the log books to the workers. After the Team provided this observation to the VPP coordinator, the EZAC chair created and posted signs the following day to ensure workers and visitors could easily locate the safety logbooks.

Every Monday, HAMMER holds the *Safety Start Meeting*. The *Safety Start Meeting* helps focus the workers on safety at the start of each workweek. HAMMER expects all available employees to attend. The Team observed the *Safety Start Meeting* during the review. The meeting included a safety presentation on the potential health effects of the switch from Daylight Savings time back to Standard time, which had just occurred that weekend. Statistics provided indicate a 25 percent increase in heart attacks and a 67 percent increase in vehicle accidents on the Monday after the time change. The presenter described methods personnel could use to help them adjust to the time change and minimize the potential side effects.

During the Safety Start meeting, employees were also encouraged to give their own personal "Safety 24/7" safety examples. "Safety 24/7" addresses workers' personal experiences and is a direct result of the Pride, Family, Innovation, and Teamwork Core Covenant program. The covenants are core values that employees feel embody the attributes of HAMMER. HAMMER employees worked with their managers to choose their covenants. With both employees and managers working together to achieve these covenants, they have common ownership.

Three employees shared their own "Safety 24/7" stories, including a weekend travel experience driving from Seattle through the Snoqualmie Pass that was closed due to inclement weather and vehicle accidents. The example progressed into a discussion of preparing for winter weather, including loading provisions into the vehicle to ensure safety if stranded. Other examples included a personal health issue and stressing the importance of being mindful of changes in health, and a grease fire at home that family members initially tried to extinguish by using water and eventually used the correct fire extinguisher. The discussion included soliciting suggestions from the group as to the proper methods to extinguish a grease fire. Overall, the discussions resulted in an enthusiastic interaction within the audience.

The Safety Start meeting also included the "Thanks and Recognition" awards for the previous month. These awards provide peer acknowledgement and recognition for the efforts of individuals from their coworkers who nominate them. The meeting is a positive tool that communicates important information to all HAMMER employees and helps them refocus on working safely at the start of each workweek.

HAMMER uses multiple methods to recognize worker achievements. The Safety Awareness and Recognition Program Guidance Document, *MSC-GD-WP-40128*, provides guidance for on-the-spot awards applicable to all MSA employees and subcontractor employees. There are three types of safety recognition awards: on-the-spot awards that are a safety token awarded for observed safe behaviors by peers, supervisors, upper management, or the Hanford Atomic Metal Trades Council (HAMTC) safety representatives; group awards through the performance incentive plan for safety; and stretching incentive awards.

EZAC chairs implement HAMMER awards to promote and encourage employees' safe behaviors and an overall positive safety culture, both at work and at home. The Team observed several examples of the recognition process during the review. At the Safety Start meeting, the EZAC chair announced "Thanks and Recognition" awards for several employees that were recommended by coworkers for safe behaviors and/or special efforts to accomplish a task. In addition, the Team attended a recognition luncheon for all HAMMER employees to demonstrate appreciation for the workers' participation in worksite walkdowns, safe work practices, and overall safety performance. MSA guidance documents provide HAMMER employees with the details of the process.

The Work Control Group represents the managers, supervisors, and maintenance and operations workers who maintain the HAMMER facility per the Work Control Process defined in the MSA/HAMMER work control process. During an interview with the work control group, the Team interviewed a manager that recently recommended a craft electrician for an innovative recognition award. The recognized craft employee was performing corrective maintenance to repair inoperative float switches in the HAMMER water pond wet wells. The original work package required draining the pond and entering a confined space to repair the float switch wiring. During the walkdown for the work, the electrician proposed an alternate approach. The proposed fix used waterproof splices to repair the damaged float switches and eliminated the need for a confined space entry and the associated potential hazard exposures, while greatly reducing the time required to perform the corrective maintenance. In addition, because the pond was not available as a water source during this work, the HAMMER facility avoided the expense of paying Richland City for the water needed during fire training exercises. Not only did the timesaving innovative recommendation result in a safer job for the worker, it reduced costs for the facility. The worker's proposed change to the work package is an excellent example of the improved communication between managers and the crafts and demonstrates the efficiencies achieved through improved worker involvement in work planning.

All HAMMER employees interviewed stated that they would report safety concerns directly to their managers. According to workers, HAMMER addresses all safety concerns in a timely manner.

Conclusion

The EZAC continues to be the primary method for employee involvement at HAMMER. Based on an opportunity for improvement in the 2014 report, HAMMER revised the EZAC charter to reflect roles and responsibilities of the chairs. In addition, the EZAC has been more involved in addressing broader site concerns. Clear and open communications between managers and employees was evident during this review. HAMMER continues to apply multiple methods to recognize and award worker achievements promoting a safe workplace. HAMMER continues to meet the Employee Involvement expectations for continued participation in DOE-VPP.

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 control new hazards. Implementation of the first two core functions of an integrated safety management system (ISMS), defining the scope of work and identifying and analyzing hazards, form the basis for a systematic approach to addressing 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 and include a system to ensure that new, or newly recognized, hazards are properly addressed. Successful worksite analysis also involves implementing preventive and/or mitigative measures during work planning to anticipate and minimize the impact of such hazards.

The 2011 and 2014 reviews at HAMMER found workplace hazards to be well characterized, analyzed, and controlled. Even though HAMMER endeavors to provide the most realistic training situations practical, typically ones that involve upset or emergency conditions, the hazards are evaluated by use of simulations and props.

MSC-PRO-26025, *Developing Training Programs*, defines the process for developing training courses and includes requirements for the identification, analysis, and control of hazards associated with the training. HAMMER uses procedure HM-FP-01, 3.3, *HAMMER Hanford Training Hazard Analysis and Control Process* to identify and control hazards for new or proposed training. The development process begins with a Training Request, followed by a Needs Analysis Report. Once approved, new training is prescreened using a *Hazard Identification Checklist,* Appendix D of HM-FP-01, 3.3, and Form HM-FP-01-3.3, *Training Hazard Screening Form.* The checklist and form help classify training activities as low, medium, or high risk. Medium and high-risk training activities require a formal documented hazard analysis. Classes limited to computer-based training, classroom training with no props or equipment, and written exams with no practical demonstration required, receive a low risk classification, and result in a determination of "No Safety Review Required." The Team did not identify any unanalyzed hazards associated with training activities.

For maintenance work, HAMMER continues to use procedure MSC-PRO-079, *Job Hazard Analysis,* to evaluate hazards at its site. This procedure integrates the MSA GHA, the craft-specific hazard analysis (CSHA), and the job hazard analysis (JHA) processes. An associated guide for this procedure, MSC-GD-17132, *Job Hazard Analysis Process Guide,* provides information and instruction to support consistent implementation of JHA. MSA applies this process to all activities, including those at HAMMER and other MSA sites.

The Team reviewed completed work packages developed using the MSA-approved work control process for the MSA-deployed crafts at HAMMER. The work control process classifies work as GHA, CSHA, permitted work, and planned work depending on the required level of additional planning and hazard analysis. Interviews with the work control supervisor and crafts indicated a good working relationship with the assigned crafts. Craft workers and supervisors walk down all work not screened out as low hazard and then help develop the work package.

The Team reviewed HAMMER CSHAs for the Teamsters. The CSHA included tasks performed by Teamsters and provided appropriate controls for those activities. The CSHA included a

Chemical Use Attachment (CUA) that listed the chemicals the Teamsters might encounter during their approved CSHA activities. The CUA included descriptions of the chemicals, the hazards associated with their use, and the appropriate controls.

HAMMER conducts monthly safety inspection walk downs that involve craft workers, instructors, managers, HAMTC safety representatives, and safety professionals. The monthly inspection reports use detailed safety inspection sheets that categorize areas for review and provide checklists of potential weaknesses. HAMMER expects that all workers will participate on at least one quarterly workplace safety inspection/walk down annually. Many workers exceed this expectation and regularly participate in walk downs. The Team shadowed two worksite safety inspection/ walk downs. The walk downs focused on the Al Alm Annex, Hoisting and Rigging Pad, MO-261, and the vehicle fire simulator. The workers involved were engaged and eagerly participated. Because walk downs are so frequent, the walk down teams had difficulty identifying new safety issues. HAMMER continues to use this process to encourage a mentoring relationship between the safety and health staff and other workers.

In 2014, the monthly safety inspections/ walk downs and EZAC minutes highlighted general housekeeping issues, but those reports did not provide sufficient detail to identify negative trends. In response, senior managers initiated a more comprehensive approach to the safety inspections that expanded the checklist. The new checklist provides for more details in the housekeeping description. HAMMER also expanded the safety inspection process to include additional areas, such as Conex boxes and unoccupied storage sheds. Managers review the information from the walk downs for trends to identify areas requiring attention. Housekeeping problems, identified in previous reports, was not an issue.

Conclusion

Hazards at the HAMMER facility are effectively analyzed. Employees actively inspect worksites for new hazards or degrading conditions and track corrective actions to closure. Training hazard analysis processes are well developed to ensure students are provided a safe and healthful training environment. HAMMER continues to meet the Worksite Analysis expectations for continued participation in DOE-VPP.

VI. HAZARD PREVENTION AND CONTROL

The third and fourth core functions of an 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 controlled using engineered controls, administrative controls, or PPE. Equipment maintenance processes must ensure compliance with requirements and emergency preparedness. Safety rules and work procedures must be developed, communicated, and understood by supervisors and employees. These rules and procedures must also be followed by everyone in the workplace to prevent, control the frequency of, and reduce the severity of mishaps.

The 2014 review Team noted that HAMMER continued to search for ways to implement the hierarchy of controls. HAMMER had effective processes to ensure hazards were adequately controlled. The use of substitution, engineered controls, then administrative controls or PPE was noteworthy across the facility.

HAMMER is implementing an engineered fix to improve productivity and eliminate ergonomic hazards associated with issuing respirators. Current procedures present ergonomic risks from frequently handling respirators, regulators, and other equipment. Planned improvements include the use of radio frequency identification (RFID) tags that will allow for an instant count of incoming and outgoing respirators. The system allows for inventory control and reduces respirator handling. This new technology will improve safety and productivity.

In another case, workers identified problems with the respirator fit-test areas. After HAMMER relocated the respirator fit-test process location, the mask fit technicians recognized the need to redesign and reorganize the area so that worker flow through the testing process was safer and more efficient. To determine an adequate respirator fit, HAMMER used airborne candle particulates in the room as a baseline, which it compares with the concentration inside the respirator. Use of candles during fit testing is common throughout industry. The original floor plan caused workers waiting to be fit-tested to hold the test area door open. The open door disrupted airflow and airborne particle concentration inside the room causing in-progress fit tests to terminate unexpectedly. HAMMER managers responded by providing engineering, financial, and craft support. The fit test area renovation eliminated the problem of waiting workers holding the door open. In addition, the fit-test area renovation created a safer, more functional space using an open floorplan with better lighting and more efficient space for training. Worker-trainers designed space dividers that carpenters built and painted on site. The Teamsters delivered and positioned the units, and the carpenters completed the installation. After the retrofit, workers performing respirator fit-testing identified, with help from MSA IH staff, an equally effective alternative to the candle particulates. A salt vapor particulate generator was substituted for the candles, thereby reducing the fire risk and personnel sensitivities to the candle combustion products.

Another example of engineered controls involves HAMMER's use of heat stress monitoring for training. Since Polar® and Bluetooth®-capable heart rate monitors are in use at various sites at Hanford, HAMMER worker-trainers took the lead to procure heart rate monitors similar to those used in the field. The training gives students real time classroom experience with the devices which prepares them for actual work conditions and helps them understand the capabilities of the devices to identify heat stress effects on workers.

Demonstrating the use of administrative controls for addressing heat stress, HAMMER curtailed the practical outdoor portion of HAZWOPER training during the summer due to excessive heat. HAMMER moved portable training props indoors to minimize heat stress for students wearing impermeable suits.

HAMMER uses PPE as a last resort to protect personnel from hazards. It supplies the craft workers with safety glasses, high-visibility vests, hardhats, hearing, and hand protection.

A work control group, supported by full-time craft workers that include pipefitters, electricians, and stationary operating engineers, implement the HAMMER maintenance program. The MSA central maintenance pool provides craft workers when HAMMER requires additional support. Because the Hanford tank farms and the demolition of the Plutonium Finishing Plant have overall site priority, HAMMER routinely performs maintenance work on Fridays and weekends. The maintenance backlog remains low.

Recent water intrusion into some buildings resulted in a worker concern for indoor air quality due to mold. HAMMER employed the help of an MSA industrial hygienist. MSA sent air samples to an offsite laboratory for analysis and provided the results to workers. Although the samples revealed no health concern, HAMMER considered the water intrusion unacceptable and initiated repairs. These actions demonstrated that HAMMER responds to employee concerns and takes action to provide a safe work environment.

HAMMER uses the HPM Corporation (HPMC) for occupational health services. HPMC provides occupational health services to the entire Hanford site through a prime contract with DOE's Richland Operations Office. HPMC, a small, women-owned business provides services in occupational medicine, environmental safety and health, risk communication, health data analysis and trending, health education and promotion (wellness), industrial rehabilitation and ergonomics, behavioral health services, and project management. To provide these services, HPMC operates and maintains two clinical facilities. Also, as part of the requirements in 10 CFR 851, *Worker Safety and Health*, HPMC supports epidemiological studies and maintains medical records of Hanford workers. HPMC provides occupational medical services to approximately 9,000 employees working for Hanford site contractors, DOE offices, or others working onsite. However, HMPC does not provide medical treatment beyond first aid. HPMC refers injured or ill workers to outside medical providers.

One of HAMMER's mission tasks is to provide EP and response classes. The MSA company-level procedure MSC-PRO-7647, *Emergency Preparedness Program Requirements,* governs HAMMER's EP program. The procedure describes the Facility Emergency Response Organization (FERO) roles and responsibilities, and training requirements. HAMMER uses drills as an integral part of the EP program to train employees and test the effectiveness of emergency response capabilities. FERO personnel participate in a minimum of one EP drill annually or enough to maintain proficiency in accordance with MSC-PRO-7647, *Emergency Preparedness Program Requirements*. To supplement these drills, the EZAC chair conducts tabletop drills during EZAC meetings (See Employee Involvement). No physical emergency drills occurred at HAMMER during this review.

Like many of its programs, a company-level procedure covers HAMMER's disciplinary process. MSC-POL-11385, *Standards of Conduct,* establishes acceptable work behaviors, standards, and

practices; establishes a disciplinary process that evaluates incident/noncompliance facts; and consistently applies the principles of progressive discipline if warranted.

There is no radioactive material at the HAMMER facility except sources used to conduct radiological training for health physics technicians. The MSA radiation protection program and 10 CFR 835, *Occupational Radiation Protection,* govern accountability for these sources.

Conclusion

HAMMER continues to have effective processes that ensure hazards are adequately controlled. The use of hierarchy of controls; i.e., the use of substitution, engineered controls, then administrative controls or PPE, was evident across the facility. HAMMER continues to meet the Hazard Prevention and Control expectations for continued participation in DOE-VPP.

VII. SAFETY AND HEALTH TRAINING

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

The 2014 review concluded that HAMMER's initial and ongoing training for workers, supervisors, and managers continued to ensure they understood the hazards and controls within their work areas. As the premier professional training site within the DOE complex, HAMMER staff was among the most knowledgeable and best trained personnel at the Hanford site.

The MSA training and qualification programs ensure that all MSA and subcontractor employees receive appropriate training to recognize hazards of work environment to protect themselves and coworkers. The training process is systematic and provides requisite knowledge, skills, and abilities to perform tasks competently and safely. It applies to all employees and all aspects of MSA operations (including HAMMER), design, procurement, construction, and support activities.

HAMMER provides initial and recurring training for HAMMER employees, and all other workers at the Hanford site. These include HGET, Radiological Worker I and II, Radiological Control Technician, HAZWOPER training, Lockout/Tagout, Beryllium Awareness, and Respiratory Protection. HAMMER provides a large variety of additional training such as fall protection, confined space entry, electrical safety, load securement, and hoisting and rigging. In addition, HAMMER makes facilities (props for hands-on training) available for firefighting, law enforcement, National security, and defense organizations.

The majority of Hanford employee safety training occurs at HAMMER. One of the core concepts of the HAMMER training focuses on *Workers Training Workers*. HAMMER established a partnership with the labor unions that allows the bargaining unit employees with subject-specific expertise to train other employees in a hands-on environment at the HAMMER facility. The *Workers Training Workers* technique has proven very successful in sharing current trade experience. Presently, HAMMER has 73 worker-trainers from across the Hanford site. Worker-trainers meet the HAMMER worker-trainer qualification standard. After completing training, the worker-trainers must commit to providing one week of training per month at the HAMMER facility. The worker-trainers provide training for lockout/tagout, electrical safety, HAZWOPER, etc., in the hands-on training courses. MSA and other site contractors, including CHPRC, WRPS, and the Pacific Northwest National Laboratory, all support the *Workers Training Workers* approach at HAMMER.

HAMMER updated the Employee Handbook that it provides to newly assigned employees. The information contained within the handbook is an excellent resource that introduces workers to the HAMMER facility. It also is a good resource for employees to review requirements or to use as a knowledge refresher.

Over the past 4 years, five separate reports have evaluated the Hanford IH program (and other related activities), and found deficiencies. In response, DOE tasked HAMMER in March 2017

to develop a centralized IHT training program for CHPRC, WRPS, and MSA. HAMMER established a development team, consisting of training specialists, HAMTC and Central Washington Building Trades worker-trainers, IHTs, stewards, and HAMMER staff to develop the program. The development team benchmarked many IH training programs across the Nation, including government organizations, such as National Institute for Occupational Safety and Health, private industry, and a variety of universities. The resulting training program includes 14 fundamental training courses, several continuing training courses, and WRPS and CHPRC's on-the-job training/on-the-job evaluation and qualification expectations.

For the past several years, HAMMER was tasked to identify and provide training system improvements across the Hanford site. The Hanford site maintains numerous databases used for multiple purposes. However, these standalone databases do not communicate with each other. This lack of communication between the systems contributes to training scheduling inefficiencies. For example, Hanford site contractors use the Electronic Learning Management (ELM) system to schedule employee training based on available courses. Historically, training coordinators schedule worker training and notify the workers of that training through that system. However, a worker's scheduled training may conflict with a worker's medical evaluation identified in the medical or employee job task analysis (EJTA) systems, and the planner has no way to know that until the medical evaluation is scheduled and the worker is notified. These conflicts occur often and result in no-show training and inefficient workload management of employees.

In order to address these inefficiencies, HAMMER developed HITS. HITS combines 13 Hanford databases into one "datamart." The systems' databases integrated into the "datamart" include the EJTA, ELM, Grantee Instructor Release System (GIRS), medical, and eight others. By combining specific elements of the databases into one "datamart," HITS consolidates data to support training "bundling" opportunities, monitors ELM for training conflicts and disconnects, assists in identifying unnecessary training (training plan cleanup), and facilitates developing training metrics.

By comparing scheduled training in ELM and the medical evaluations listed in EJTA or medical, HITS identifies training and medical evaluation conflicts. HITS automatically identifies when medical and training requirements have conflicting scheduling. When it identifies a conflict, the system automatically notifies the training coordinator by e-mail and recommends available courses so the conflict can be resolved. The conflict resolution process is extremely successful at reducing training and/or medical evaluation no-shows.

HITS contains a recommendation engine that identifies "bundling" opportunities. Many training classes at the Hanford site are only 4 hours long, and most medical evaluations are less than 2 hours. In many cases, workers attending those functions are unable to perform other work tasks that day because they did not attend the prejob briefs. As a result, partial day training and medical evaluations result in a full day without other work. The recommendation engine automatically identifies "bundling" opportunities to combine those functions into the same day. By bundling workers to attend two 4-hour training courses, or combining a 4-hour course with a 2-hour medical evaluation on a single day, HITS helps the site contractors increase productivity.

HITS has other scheduling features that improve efficiency. The software identifies and automatically suggests "bump" options. Many times, several workers may require identical

training, but there may not be enough seats in the available classes to accommodate all the workers. The system identifies workers by priority (i.e., workers whose training lapses earlier than that of others) and recommends who to "bump" and then reschedules training for them later before their training expires.

HAMMER is planning to rollout HITS in 12 elements/phases. HAMMER initiated the HITS bundling and automatic scheduling element in September 2017. The Team observed a demonstration of this capability. HAMMER activated the conflict identification and notification e-mail elements in mid-October. As the process continues, the HITS developers are working closely with the Hanford training coordinators to identify any issues or concerns and to continue to identify additional training improvements.

The HITS program will greatly reduce training scheduling inefficiencies and improve workload resource planning. MSA should consider sharing HITS program at the Region X and/or the Voluntary Protection Programs Participants' Association Inc. National conference to demonstrate its unique approach to improving the training process and increase efficiency.

Opportunity for Improvement: MSA should consider sharing the HITS program at the Region X and/or the Voluntary Protection Programs Participants' Association Inc. National conference to demonstrate its unique approach to improving the training process and increase efficiency.

Conclusion

The HAMMER safety training program provides training for workers, supervisors, and managers to ensure they fully understand the hazards and controls within their work areas. Because of the nature of its mission, the HAMMER staff includes the most knowledgeable and best trained personnel at the Hanford site. HAMMER developed HITS to reduce training system inefficiencies across the Hanford site, and developed a centralized IHT training program for CHPRC, WRPS, and MSA to address deficiencies identified in several independent IH evaluations. HAMMER continues to meet the Safety and Health Training expectations for continued participation in DOE-VPP.

VIII. CONCLUSIONS

Managers and employees working together over the past 3 years have reduced the injury rates at HAMMER to zero. In addition, HAMMER subcontractors have not had any injuries over that same period. Teaming with workers, managers fully support continued improvement and encourage innovative ideas to accomplish training safely. The management commitment to EZAC is evident and is demonstrated by a dedicated management champion that attends all EZAC meetings. Employee involvement is evident, and HAMMER employees have genuine ownership of their safety and health program. Because the small workforce creates a family atmosphere, employees regularly interact and, as a team, actively identify safety and health hazards. HAMMER uses the hierarchy of controls to mitigate or control hazards. HAMMER managers and the workforce are fully committed to the tenets of DOE-VPP. Using innovative approaches to ensure training is safely accomplished, HAMMER provides safe, quality training to DOE and other emergency responders. HAMMER demonstrates the continuous improvement expected for ongoing participation in DOE-VPP, and the Team recommends it continue to participate in DOE-VPP at the Star level.

Appendix A

Onsite VPP Audit Team Roster

Management

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

Andrew C. Lawrence (Retired from DOE January 2018)
Deputy Associate Under Secretary for
Environment, Health and Safety

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 (AU-12)
Office of Health and Safety

Review Team

Name	Affiliation/Phone	Project/Review Element
Richard C. Caummisar	DOE/AU-12	Team Lead Management Leadership, Worksite Analysis, Hazard Prevention and Control
Michael S. Gilroy	DOE/AU-12	Employee Involvement, Worksite Analysis, Safety and Health Training