Wastren Advantage Inc. Hanford Laboratory

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
September 10-14, 2018

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The Department of Energy's (DOE) Voluntary Protection Program (VPP) Team from the Office of Environment, Health, Safety and Security (AU) recommends that Wastren Advantage Inc. Hanford Laboratory (WHL) continue to participate in DOE-VPP as a Star site.

Background

WHL is the 222-S Laboratory Analysis and Testing Services (LATS) contractor for DOE's Office of River Protection (ORP) at the Hanford Site. WHL began operating the 222-S Laboratory on November 22, 2015. Prior to this transition, the laboratory was operated by Advanced Technologies Laboratories International, Inc., which participated in DOE-VPP at the Star level. On February 1, 2016, WHL expressed the intent to continue in DOE-VPP in a letter to DOE-ORP and began its 24-month transition period.

The WHL mission, under a small business contract, is to analyze highly radioactive samples and mixed wastes, and support the various cleanup contractors at the Hanford Site. These analytical services include: receiving, handling, analyzing, and storing samples; performing special tests; and reporting the results to the customer. WHL uses analytical equipment installed by the Tank Farm contractor, Washington River Protection Solutions, LLC (WRPS), under an administrative interface agreement [TOC-AIA-LATS-00060, *Administrative Interface Agreement between Washington River Protection Solutions, LLC, and Wastren Advantage Inc. for 222-S Laboratory Analytical Services and Testing*]. WRPS maintains the facility and analytical equipment, installs new equipment, and operates facility-related infrastructure.

Participation in DOE-VPP past the transition period requires an onsite review by AU's DOE-VPP Assessment Team (Team) to determine if WHL continues to meet the standards for DOE-VPP Star status. The Team performed a transitional review September 9-14, 2018, and evaluated WHL's safety programs using DOE-VPP expectations. During the onsite review, the Team interviewed approximately 50 percent of the workers, including supervisors, managers, and workers; and observed plan-of-the-day and prejob meetings, along with work activities.

Results

Management Leadership

WHL has experienced staffing challenges since it took over the management of the 222-S Laboratory in November 2015. It was reported that after the contract transition, another Hanford prime contractor hired approximately 30 percent of WHL's technical/analytical staff. Chemists (exempt staff), as well as chemical technologists (represented employees) were hired away from the laboratory. Additionally, the collective bargaining agreement allows displaced union employees from other Hanford contractors to replace bargaining unit employees (i.e., WHL) based on seniority under

certain conditions. Because of this, WHL was at risk of losing other experienced personnel. The loss of experienced WHL bargaining unit staff resulted in the loss of analytical and institutional proficiency. Recognizing this problem, WHL took actions to compensate for these losses and ensure continued continuity of safety and quality. Actions taken included:

- Increased middle managers' presence in the field by increasing the number of method assessments and surveillances (both formal and informal);
- Revised some work control documents to add additional procedural details;
- Increased chemical technologists' (bargaining unit) participation in the work control/procedure review, approval and validation process;
- Revised qualification cards;
- Established a retention process to prevent employee loss;
- Resisted the temptation to hire personnel quickly to fill positions and ensure they hired the right candidate; and
- Increased efforts to include frequent reminders in daily turnover meetings about "chemical compatibility," the *STAR* (Stop, Think, Act, Review) concept, as well as reinforcing the use of stop-work authority.

WHL managers' commitment to providing a safe workplace is reflected in WHL's *Safety and Health Policy* (WHL-POL-011). The policy establishes the protection of workers and environment as a *core value* and this core value is emphasized in the implementing documents, specifically, WHL-MP-1037, *Worker Safety and Health Program* (WSHP); and WHL-MP-1009, *Integrated Environmental, Safety, and Health Management System Description for the 222-S Laboratory Analysis and Testing Services (LATS) Contractor (ISMS)*. The Team observed the organization's commitment to a safe workplace during interviews, plan-of-the-day meetings, prejob briefings, and work activities.

WHL managers use worker recognition programs, such as the STARZ Safety Recognition award, Significant Part Of The Team (SPOTT) awards, and the Quality Assurance Superior Achievement Reward (QASAR) award to encourage worker involvement in safety programs and innovations that improve workplace safety (see Employee Involvement). WHL senior staff attend the Zero Accident Council (ZAC), give members time to participate in safety-related activities, provide funding for initiatives and safety campaigns, support the Hanford Safety Expo, and support employees attending Regional and National Voluntary Protection Programs Participants' Association Inc. conferences.

Employees reported that they regularly see their immediate supervisors and other middle managers in their workplaces, including areas where they are required e to don anti-contamination clothing. Although workers indicated there is strong support from mid-level WHL managers, they said they rarely see WHL senior managers in the workspaces. Senior managers admit they do not get the opportunity to visit laboratory spaces as frequently as they desire. Managing relationships between the other contractors and DOE takes the majority of their time. WHL is working with DOE to find ways to reduce the management workload, and free up senior managers to be more visible.

WHL has a small number of employees. Injury and illness statistics for small companies are significantly altered by a single recordable case. Therefore, DOE-VPP participants with fewer than 200,000 work hours per year may calculate injury and illness statistics using the best 3 out of 4 years for the period being evaluated. WHL does not have 4 years of data to use this method. In the 2 years after transition, WHL experienced three recordable cases. Recognizing this, WHL implemented several remedial actions. It performed workstation ergonomic evaluations, hired additional staffing to allow for increased worker task rotation, and added laboratory technologist helpers to decrease risks from repetitive tasks. WHL has not had a recordable case in 2018.

Employee Involvement

WHL's safety program includes a strong Employee Involvement element. Managers and employees work together to establish Employee Involvement in the work environment. Managers empowered employees to participate in safety and health programs by collaborating with employees and implementing initiatives that maintain open lines of communication and promote a clear understanding of safety and health responsibilities. Employees throughout the laboratory demonstrated awareness and support of WHL's expectation to work safely. Employees approached by the Team indicated their willingness to ask questions, to identify issues, and to work collaboratively to bring acceptable closure to issues related to their work.

Workers are not afraid to report any injuries, accidents, or incidents. The Team had numerous discussions with workers about reporting accidents or injuries. All workers interviewed indicated that reporting injuries, accidents, or incidents are an expectation and that they have no fear of retaliation or retribution for reporting. Employees also believe their concerns are important to managers. One example conveyed by a laboratory technologist involved a case where he expressed concern and questioned the results of a sample analysis. After discussing his concerns with his supervisor and reviewing the process, the material was re-sampled and the test was completed satisfactorily. The worker was confident that involving his supervisor in the discussion of the sample results reaffirmed his supervisor's support.

WHL has a rewards and recognition program, documented in WHL-312-2.25, *Employee Recognition.* The procedure defines the process for a WHL employee to be recognized and rewarded for a demonstrated commitment to safety and/or quality through associated activities. The allocation methods, control, and distribution of the STARZ award for safety, QASAR award for quality, VPP Steering Committee award, SPOTT award, and employee recognition awards are described in WHL-312-2.25. Employee recognition awards include both activity-based and performance-based awards. The STARZ's activity-based program is designed to increase safety awareness and encourage safe behaviors.

WHL has a ZAC committee that meets monthly. The ZAC committee is a partnership between labor and management aimed at promoting a safe and healthy work environment by continuously improving safety and health performance. WRPS and WHL safety councils interface and coordinate as necessary to achieve common objectives.

Based on the result of worker input/suggestions, WHL has implemented safety improvements to several facets of its operations. For example, WHL uses carts to transport samples, equipment, and other items around the laboratory to prevent lifting and twisting injuries. Additionally, WHL also uses different types of carts and carts with slightly different configurations to transport analytical equipment, computers, and supplies to and from workspaces. Based on employee suggestions, WHL developed and implemented two cart modifications. The first modification was to a shielded sample cart. Three employees helped design a custom sample transport cart that reduced employee dose when transporting samples, was more ergonomic, and reduced maintenance issues associated with the cart. Team interviews with these workers demonstrated that workers appreciated having the opportunity to design and implement these improvements to the cart with the full support of managers.

The second modification was inspired from an employee suggestion during the March 2018 Safety and Health Inspection. An employee described how the carts are often used as extra workspace in 222-S Laboratory when receiving samples. However, the employee indicated that the edges were too hard for resting your arms and the working surface was too low for taller employees (one employee is 6'9"). This condition exposed employees who were sorting samples to ergonomic hazards. As a result of his suggestion, WHL authorized the employee to work with the WRPS carpenters to design a portable work surface that workers could easily attach to the cart when needed. This modification simplified the sorting process and reduced ergonomic hazards. Employees appreciated managers' support to develop and implement the modifications.

Employee suggestions have also resulted in the development of two new sample holder fixtures. The first sample holder is a Plexiglas® "jig" for holding/moving small sample cups on stir plates. The fixture's design keeps the workers' hands farther from the sample, as well as reduces the potential for spill and spread of contamination to the worker. Another sample holder was designed to hold two-dram vials. While commercially available bulk vial holders (like a test tube rack) are readily available, workers felt that the size was too large for the limited hood space available. Based on worker suggestions, smaller Plexiglas® holders with holes specifically made to fit the two-dram vials were developed to increase workspace in the hood and provide a more secure sample holder for the dram vials. The employee responsible for the improved sample holders was nominated for an As Low As Reasonably Achievable (ALARA) award for the jig.

WHL establishes a review team when new procedures are initiated. The review team routinely consists of a chemist, chemical technologist, quality assurance, and safety, radiation safety personnel, procedure writers, supervisors, and other subject matter experts, as needed. When a worker recommends a change to a procedure they inform their supervisor and discuss the proposed changes. The WHL procedure group evaluates the proposed changes and transmits the revised procedure for review and approval.

WHL establishes and prioritizes tasks/activities to be completed for the day at a morning coordination meeting and other turnover meetings. The Team observed that employees actively participated in the prejob meetings.

Worksite Analysis

The WHL contract stipulates that WHL use analytical equipment installed by WRPS. WRPS also maintains the facility and analytical equipment, installs new equipment, and operates facility-related infrastructure. WRPS is responsible for maintenance of fire systems, ventilation systems, structures, piping, pumps, or to perform lockout/tagouts or confined-space entries. Therefore, the WHL work control and hazard analysis processes focus on the safe performance of work activities performed by WHL employees within the laboratory spaces. WHL receives, analyzes, archives, and disposes of a variety of samples related to the Hanford Tank Farms and other Hanford Site cleanup activities. The WHL laboratory activity hazards include hazardous chemical reactions, physical hazards, ergonomics, carcinogens, and mutagens associated with sample analysis.

WHL bases its work control processes on the risk/complexity assessment and hazard analysis of the specified tasks. Low-risk work, such as analytical work, uses controlled procedures and test plans following WHL-MP-1034, *Work Control*. This work control process integrates the various procedures and approaches used within the WHL laboratory to develop and perform work screened as low-risk. These procedures include, WHL-312-4.26, *Analytical Project Process Flow;* WHL-312-11.16, *Technical Procedure Control and Use;* and WHL-310, Section 1.18, *Preparing Recovery Plan.* Work defined as medium or high-risk by the radiological screening process is covered by the WRPS' TFC-OPS-MAINT-C-01, *Tank Operating Contractor Work Control*. WHL uses the WRPS Tank Operation Contract's work management system software Computerized History and Maintenance Planning Software to develop medium and high-risk work orders/procedures.

WHL identifies radiological risk and complexity by submitting job-specific information on a Radiological Screening Form per the instructions in WHL-312-11.16, *Technical Procedure Control and Use,* to the Radiological Control organization. The Radiological Control organization reviews the completed Radiological Screening Form using the criteria in WRPS' TFC-ESHQ-RP RWP-C-03, *ALARA Work Planning,* and determines the risk/complexity level. After the radiological risks are determined, WHL analyzes other hazards using the WHL Laboratory Worksite Hazard Analysis (LWHA) process. This process identifies the controls necessary to eliminate or mitigate industrial, radiological, and chemical hazards as required by Title 29, Code of Federal Regulations, Part 1910.1450, *Occupational Exposure to Hazardous Chemicals in Laboratories.* Typical controls identified by the LWHA include protective laboratory practices, personal protective equipment (PPE), and laboratory hoods. WHL performs initial and periodic monitoring on operations and procedures that use "select carcinogens," or other acutely toxic chemicals. The LWHA also incorporates any analysis and control requirements from ATS-310, Section 4.5, *222-S Laboratory Complex Chemical Hygiene Plan.*

ATS-MP-1033, *Hazards and Controls Inventory (HCI) for the 222-S Laboratory Complex*, documents the baseline survey of health and safety hazards for the 222-S Laboratory Complex and is available online. WHL uses a Laboratory Information Management System software to set up and control analytical projects, as well as

maintain analytical data, analyst training and performance data, and generate process control and client reports.

ATS-310, Section 9.2, *Safety Inspection Programs,* and ATS-310, Section 9.6, *Monthly Room Owner Walkdowns*, implement general worksite safety inspections. These address requirements for monthly walkdowns by facility room owners and establish a process for performance of team-based workplace safety inspections. The Team participated in a WRPS inspection of the 222-S facility during this review. The Safety Team consisted of safety professionals and volunteer employees from both WHL and WRPS. The Team noted the group's positive interaction and communication between WHL staff and the safety professionals. The group discussed all issues openly and any identified WHL specific issues were added to the safety log or the Corrective Action Management/ Price-Anderson Amendments (Act) Tracking System (CAMPATS) tracking system.

Hazard Prevention and Control

WHL uses the hierarchical approach for hazard control. Most of the WHL work involves laboratory bench work using a variety of chemicals. WHL has conducted periodic assessments based on risk and variability of the operations to ensure new or changing hazards are identified, controlled, and addressed. WHL reviews new hazards and/or controls identified during assessment activities against the baseline information in WHL-MP-1028, *Health and Safety Plan*; ATS-MP-1033, *Hazards and Controls Inventory for the 222-S Laboratory Complex*; and ATS-310, Section 4.5, *222-S Laboratory Complex Chemical Hygiene Plan.* Using the *222-S Laboratory Complex Chemical Hygiene Plan,* WHL regularly evaluates chemicals used in laboratory spaces. WHL substitutes less hazardous chemicals when appropriate to protect workers and ensure testing fidelity. Where substitute chemicals are not available or appropriate, engineered controls, such as fume hoods, hot cells with controlled ventilation, remote-handling equipment, and sophisticated analytical equipment using very small quantities of samples minimize the potential exposures to technologists and chemists. For hazards that cannot be eliminated using engineered controls, WHL uses PPE and administrative controls to manage hazardous substances in the laboratory.

Another example of WHL's hierarchical approach to mitigate hazards involved the 11A Hot Cells. In the event of a leaking gasket, bolts inside the 11A Hot Cells may have to be torqued to required specifications. Although this activity has never been done, it requires a manned entry into the hot cell to perform the task (which is a high-dose operation). It would also be physically demanding to tighten over 60 bolts in small torque increments. A WHL technologist recognized this issue and researched tools online, worked with vendors, and identified a special torque wrench that can be used remotely in conjunction with the manipulators to eliminate the need for a manned entry to perform this task. The torque wrench is motorized and can be operated from outside the hot cell, which eliminates the need for repetitive wrench handling. WHL managers have approved the purchase of the new tool and are in the process of awarding the technologist with a company recognition award for his idea and initiative.

WHL identified a different, less hazardous material for radiation shielding. By replacing lead shielding with tungsten shielding, the potential for worker exposure to lead was eliminated. After several years of effort, the ALARA Safety Committee implemented this change.

WHL achieved a second improvement in shielding by adopting the use of rectangular plastic boxes for holding stored samples. The boxes originally resolved an issue with sample tubes tipping over within the round "ice cream" storage buckets. The rectangular boxes use a thicker plastic than the ice cream buckets, providing additional shielding and reducing overall worker dose. The employee who identified the improvement was nominated for an ALARA award in 2017.

WHL interfaces with WRPS industrial hygiene (IH) and safety professionals to coordinate IH and safety needs in accordance with the agreement between WRPS and WHL. The WRPS IH program personnel are responsible for developing and performing the sampling program and strategy for the 222-S Laboratory. The WRPS IH program works in conjunction with the WHL safety professional to coordinate the results of the sampling programs and together provide the monitoring results of the IH sampling to the WHL employees.

HPM Corporation (HPMC) is the occupational medicine provider for WHL. HPMC provides medical surveillance, maintains medical records, provides medical evaluation, and other medical-related services as required. Kadlec Hospital in Richland, Washington, provides major emergency medical services and personnel can be transported directly there by the Hanford Fire Department Emergency Medical Services.

WRPS manages the Emergency Preparedness program at the 222-S Laboratory complex and performs one operational drill per quarter at the laboratory. WHL employees participate in all WRPS-sponsored drills associated with 222-S Laboratory in accordance with the administrative interface agreement. In addition, WRPS provides radiation protection support to WHL and to the 222-S complex. The WRPS radiological support is coordinated through the WHL Analytical Operations.

The WHL safety organization maintains a safety log spreadsheet to collect and provide status updates for employee- and safety committee-identified safety and health issues. WHL also uses the CAMPATS issues management system to track issues to closure for employee-identified, as well as workplace inspection-related safety concerns/issues.

During the Safety Team walkdown and other routine work observations, the Team observed excellent housekeeping practices at the 222-S Laboratory. Administrative and laboratory workspaces were well-organized and equipment and chemicals were properly stored. Facility and laboratory workplaces were clear of obstructions. Safety and Health postings were current and posted in appropriate locations throughout the facility. The Team also observed that permanent equipment, such as emergency eyewash stations and showers, had been regularly inspected.

Safety and Health Training

WHL has increased its emphasis on health and safety training. All new employees receive the initial Hanford General Employee Training. Newly hired employees indicated that the training provided involved actual working conditions and prepared them to work at the 222-S Laboratory.

WHL managers recognized a need to improve Qualification Cards, as well as develop a new approach to Continuous Improvement Training. WHL currently trains new chemical technologists by assigning them to an experienced mentor. The Training Lead and the Laboratory Manager are also working together to update the Qualification Card requirements for the new hires. (See Management Leadership). Several chemical technologists indicated that this approach was not optimal because most chemical technologist new hires lacked experience with WHL processes, and that lack of experience required additional attention from the experienced chemical technologists to walk them through the processes that caused negative production impacts. As a result of these suggestions, WHL hired a Training Lead, through the WHL contract partner, Test America, to make improvements to its training processes. To address the concerns raised by the mentors, WHL should ensure the experienced chemical technologists work with the new training personnel to develop training for newly hired chemical technologists.

Opportunity for Improvement: WHL should ensure the experienced chemical technologists work with the new training personnel to develop training for newly hired chemical technologists.

WHL employees participated in the Safety Expo in April 2018, along with other contractors from the Hanford Site. Managers and the VPP committee solicited suggestions for worker presentations at the Safety Expo. A team was put together to setup and run the laboratory booth. WHL encouraged all employees and their families to attend.

WHL has a Lessons-Learned program that is an effective tool to ensure workers learn from information about similar events. The WHL Lessons-Learned Coordinator distributes required reading and lessons-learned information to all employees electronically, as well as through the OPEXSHARE Bulletin. A recent publication, WHL-OEB-2017-001, *Hazardous Waste Placed in Municipal Trash*, emphasized communication when performing similar tasks at WHL.

WHL has begun efforts to use mockups in the future for more realistic training. The Laboratory Manager and Operations Manager, along with the Training group, are seeking a location for a mockup facility. Another training improvement effort includes the creation of a Tiger Team committee. This monthly Tiger Team Committee meeting includes a cross-section of workers to ensure training needs are identified.

Conclusion

WHL has effective processes that identify and analyze hazards associated with performing laboratory analyses, processing samples, and disposing of waste. Managers provide the necessary support and encouragement so that employees actively engage with, and are involved in, the safety and health program. Improvements to training help ensure personnel are qualified to recognize hazards they may encounter and can perform their duties in a safe and reliable manner in accordance with managers' expectations. Managers and employees are collaborating to install effective engineered controls and develop and implement usable procedures and instructions that permit safe conduct of sample processing.

Injury Incidence/Lost Workdays Case Rate (WHL)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate per 200,000 hours	DART* Cases	DART* Case Rate per 200,000 hours
2016	97,343	1	2.05	1	2.05
2017	100,152	2	3.99	2	3.99
2018[#]	68,958	0	0.00	0	0.00
3-Year Totals	250,082	3	2.39	3	2.39
Bureau of Labor Statistics (BLS-2016) average for NAICS** 56291 Waste Management and Remediation Services			4.2		2.7

* Days Away, Restricted, or Transferred
**North American Industry Classification System
[#] Data for 2018 is for 1st and 2nd quarter CY only

WHL experienced one recordable case in calendar year (CY) 2016 and two recordable cases in CY 2017. A review of the accident and injury logs was conducted along with an interview with the WHL Case Manager. The Case Manager did not report any pressure from WHL managers to change recordablity decisions. No underreporting or discrepancies were found. The Team also reviewed three quarterly assessment reports from DOE ORP that did not identify any discrepancies. WHL's 3-year average injury rates are 43 percent below the averages for the comparable industry and meet the accident injury criteria for continued participation in DOE-VPP at the Star level.