U.S. Department of Energy
Voluntary Protection Program
Recertification Review of
Washington River Protection Solutions, LLC
at Richland, WA

Office of Environment, Health, Safety and Security
Office of Health and Safety

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PREFACE

The Department of Energy (DOE or Department) recognizes that excellence can be encouraged and guided but not standardized. 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 encourages DOE contractors and subcontractors to surpass compliance with DOE requirements and achieve excellence through systematic approaches emphasizing creative solutions through cooperative efforts with managers, employees, and DOE.

DOE-VPP bases program participation on the existence of comprehensive safety management systems that ensure employees are actively involved in assessing, preventing, and controlling the potential safety and health hazards at their sites. All DOE complex contractors may participate in DOE-VPP, including production facilities, laboratories, subcontractors, and support organizations. In keeping with DOE-VPP philosophy, *participation is strictly voluntary*. Additionally, any participant may withdraw from the program at any time.

DOE-VPP consists of three levels of participation (like those in OSHA VPP): Star, Merit, and Demonstration. The Star 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 that DOE needs to learn more about before determining approval requirements for the Merit or Star level.

Approving an applicant for participation in DOE-VPP demonstrates DOE recognition that the applicant exceeds the basic elements of systematic protection of employees at the site. Participants receive certificates of approval and the right to use flags showing the appropriate DOE-VPP program level the contractor has achieved. Participants may also choose to use the DOE-VPP logo on its letterhead or award items for employee incentive programs.

This report summarizes the results from the recertification review of Washington River Protection Solutions, LLC (WRPS), the operator of the Tank Operations Contract at the Hanford Site in Richland, WA, conducted from March 11 to April 25, 2024. This report provides the Director of the Office of Environment, Health, Safety and Security with the necessary information to make the final decision regarding continued WRPS participation in DOE-VPP at the Star level.

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ABBREVIATIONS AND ACRONYMS

BLS	Bureau of Labor and Statistics
CAIRS	Computerized Accident Incident Reporting System
CFR	Code of Federal Regulations
CTF	Cold Test Facility
DART	Days Away, Restricted and Transfer
DOE	Department of Energy
DSA	Documented Safety Analysis
EAM	Enterprise Asset Management
EAPC	Employee Accident Prevention Council
EHSS	Office of Environment, Health, Safety and Security
EHSS-12	Office of Worker Safety and Health Assistance
EJTA	Employee Job Task Analysis
ETF	Effluent Treatment Facility
GHA	General Hazard Analysis
HAMTC	Hanford Atomic Metal Trades Council
IH	Industrial Hygiene
IHA	Inomedic Health Applications
IHT	Industrial Hygiene Technician
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
NAICS	North American Industry Classification System
OSHA	Occupational Safety and Health Administration
PAPC	President’s Accident Prevention Council
PPE	Personal Protective Equipment
SBT	Safety Basis Training
SME	Subject Matter Expert
SOC	Skill of the Craft
SWIHD	Site Wide Industrial Hygiene Database
Team	VPP Assessment Team
TOC	Tank Operations Contract
TRC	Total Recordable Case
TSCR	Tank Side Cesium Removal
TSR	Technical Safety Requirements
USQ	Unreviewed Safety Question
VPP	Voluntary Protection Program
WRPS	Washington River Protection Solutions, LLC
WTP	Waste Treatment and Immobilization Plant

EXECUTIVE SUMMARY

The Department of Energy (DOE) Voluntary Protection Program (VPP) Assessment Team (Team) from the Office of Environment, Health, Safety and Security (EHSS) conducted the triennial review of Washington River Protection Solutions, LLC (WRPS), the operator of the Tank Operations Contract at the Hanford Site in Richland, WA, from March 11 to April 25, 2024, and recommends that WRPS continue to participate in DOE-VPP at the Star level. This report summarizes the DOE-VPP review results supporting the Team recommendation.

The DOE Office of River Protection located in Richland, WA, manages the storage and treatment of 56 million gallons of radioactive and chemical waste stored in 156 underground tanks on the Hanford Site. Since 2008, WRPS has been the contractor responsible for storing, retrieving, and preparing the tank waste and associated facilities for treatment through vitrification, or immobilization in glass.

EHSS conducted the DOE-VPP review using a combined virtual and onsite approach to verify that WRPS continues to meet expectations for continued participation at the Star level. The results of the review indicated that WRPS is:

- Committed to ensuring accomplishment of mission safely, without unnecessary or unanalyzed risks.

- Engaging the workforce in maintaining a strong safety culture and empowering workers to identify issues, recommend improvements, and stop and pause work when questions or issues arise.

- Correctly identifying and analyzing hazards using teams of subject matter experts, workers, and managers, and maintaining job hazard analyses for all work activities.

- Properly controlling hazards using the appropriate hierarchy of controls and engaging safety and health professionals to properly define, authorize, control, and complete work safely.

- Appropriately training and qualifying all workers, managers, and subcontractors to recognize and control hazards.

- Maintaining accident and injury rates that are lower than comparable industries.

WRPS continues to improve leveraging tools, such as the use of the Enterprise Asset Management software to track maintenance activities within the Hanford Site tank waste operations. WRPS maintains a well-established structure of safety committees and councils whose purpose is to seek, identify and resolve employee concerns. Workers are provided a voice to identify concerns through multiple avenues, receive high-quality support from safety professionals and subject matter experts, and encounter strong safety committee engagement to keep safety expectations at the forefront. WRPS staff recognize that collaboration among different site contractors and its own internal organization is critical to ensure the safety of the workforce. Senior managers demonstrate their commitment to Integrated Safety Management by engaging with the workforce and other onsite contractors to clearly communicate safety policy,

expectations, and operational priorities; and track such engagement to draw conclusions on its effectiveness. WRPS provides safety and health training to all employees, supervisors, and managers. Work control processes integrate safety analysis results into work instructions, procedures, and training to ensure awareness of the type of potential hazards, the procedures to identify and report on hazards, and the programs or processes to mitigate the potential hazards.

WRPS effectively applies the DOE-VPP tenets to maintain a workforce that understands safety and health responsibilities and performs work within appliable procedures and regulations. The Team identified some opportunities for improvement that may assist WRPS efforts to empower its workforce and recognize the strengths of its staff. The Team did not identify any programmatic noncompliance with DOE safety requirements that would preclude participation in DOE-VPP.

OPPORTUNITIES FOR IMPROVEMENT

Description	Page
WRPS leaders should carefully consider the scope of existing safety policies and programs when implementing new initiatives to prevent duplication of resources and goals while incorporating past good practices and lessons learned. Consider opportunities to modify and improve existing programs versus layering additional initiatives to avoid diluting positive efforts.	**6**
WRPS should consider expanding the number of EAPCs as opposed to combining EAPCs to accommodate the WTP activities utilizing video conferencing for remote locations to ensure to member participation.	**13**
WRPS should review workplace inspection policies, procedures, training, and qualification requirements to ensure individuals conducting workplace inspections are familiar with common safety hazards and applicable abatement methods.	**20**
WRPS should review the safety program documents associated with the Hearing Conservation Program, Silica Program, and Hazard Communication Program to ensure that the programs clearly demonstrate and document compliance with their associated regulatory requirements.	**21**
WRPS should consider utilizing the EAM mobile platform to add the capability of accessing and entering data in real time during maintenance operations.	**21**

I. INTRODUCTION

This report provides the Department of Energy (DOE) Director, Office of Environment, Health, Safety and Security (EHSS), the results of the recertification assessment of the Washington River Protection Solutions, LLC (WRPS) operations at the Hanford Site located in Richland, WA conducted from March 11 to April 25, 2024. Based on this review, the DOE Voluntary Protection Program (VPP) Assessment Team (Team) recommends that WRPS continue to participate in DOE-VPP at the Star level.

The DOE Office of River Protection in Richland, WA, manages WRPS Tank Operations Contract (TOC) as one of the environmental cleanup sites under its purview. WRPS is the contractor responsible for the tank farm cleanup operations at the Hanford Site. WRPS is responsible for base operations of the tanks, single-shell tank retrieval and closure, Waste Treatment and Immobilization Plant (WTP) support, and supplemental treatment of the approximately 56 million gallons of nuclear and chemical waste stored in tanks on the Hanford Site. This nuclear waste is the result of more than 4 decades of reactor operations and plutonium production for national defense. The systems and infrastructure that support storage of the waste in 177 underground tanks are aging and pose a threat to the environment. The solution to the challenges posed by an aging infrastructure is to safely and cost effectively retrieve, process, and immobilize this waste and execute the compliant closure of the tank farm system so that it no longer poses a threat to the environment. WRPS has managed the Hanford Tank Operations for DOE since 2008.

WRPS consists of organizations generally responsible for tank waste treatment and operations of associated support facilities. Functional organizations ensure safe and environmentally compliant operation, maintenance, radiological control, project management, construction, work management, and industrial hygiene across 149 single-shell tanks and 28 double-shell tanks.” In 2015, the operation and maintenance of the Effluent Treatment Facility (ETF), mostly responsible for tank farm operations, transferred from the CH2M Hill Plateau Remediation Company to WRPS.

WRPS employs approximately 2,525 workers and 358 subcontractor employees. WRPS workers contend with numerous hazards including environmental, industrial safety, construction, radiological, and chemical. Industrial and construction hazards include electrical, mechanical, scaffold work, and working with overhead loads. WRPS manages nuclear safety hazards during tank-to-tank waste transfer activities.

In April 2023, the WRPS contract was extended for an additional 2 years to continue operating under the TOC. WRPS has been a DOE-VPP participant since 2010 and has maintained Star status since 2014. EHSS conducted this 2024 triennial review in accordance with DOE-STD [Standard]-1232-2019, *U.S. Department of Energy Voluntary Protection Program, Vol. 1-4,* requirements to verify that WRPS continues to meet DOE-VPP expectations for participation at the Star level. The Team conducted the review in two phases. From March 11-22, 2024, the Team utilized virtual methods to interview workers and managers, attend meetings, and review documents. The Team then performed onsite observations, validations, and interviews from April 16-25, 2024.

WRPS's commitment to safety and health programs that protect employees, and the public is strong and evident. WRPS maintains an excellent safety performance record, consistently maintaining injury rates below comparable industries. This report contains a review and discussion of WRPS injury and illness rates, and an assessment of safety management system elements compared to the DOE-VPP tenets of Management Leadership, Employee Involvement, Worksite Analysis, Hazard Prevention and Control, and Safety and Health Training.

II. INJURY INCIDENCE CASE RATES

To achieve or maintain DOE-VPP Star status, a contractor's average for both Total Recordable Case (TRC) rates and Days Away, Restricted, or Transferred (DART) case rates for the most recent 3-year period shall be at or below the most recent specific industry national average North American Industry Classification System (NAICS) code published by the Bureau of Labor Statistics (BLS). The most applicable NAICS code for WRPS is 562, Waste Management and Remedial Services. The most applicable NAICS Code for WRPS subcontractors is 2362, Non-Resident Building Construction.

The following table presents the most recent 3-year period data validated by the Team using WRPS Occupational Safety and Health Administration (OSHA) 300 Logs, the DOE Computerized Accident Incident Reporting System (CAIRS), the Team's calculation of the TRC and DART rates, and the specific industry national average for the comparison industry.

3-Year Injury and Incidence Rates

Calendar Year	Hours Worked	TRC	TRC Incidence Rate (per 200,000 hours)	DART	DART Case Rate (per 200,000 hours)
Contractor Employees (WRPS TOC – CAIRS Org Code 4707104)					
2021	4,860,810	2	0.08	0	0.00
2022	4,654,259	7	0.30	3	0.13
2023	4,905,525	4	0.16	1	0.04
Total	**14,420,594**	**13**	**0.18**	**4**	**0.06**
BLS-2022 Industry Average for NAICS 562 Waste Management and Remedial Services			**3.70**		**2.60**
Subcontractor Employees (WRPS TOC Construction Subs – CAIRS Org Code 4707116)					
2021	587,412	5	1.70	1	0.34
2022	515,675	1	0.39	0	0.00
2023	375,231	2	1.07	0	0.00
Total	**1,478,318**	**8**	**1.08**	**1**	**0.14**
BLS-2022 Industry Average for NAICS 2362 Non-Residential Building Construction			**1.70**		**0.90**
Total 3 year combined rates (Contractor and Subcontractor Employees)					
	15,898,912	**21**	**0.26**	**5**	**0.06**

Discussion

WRPS has 1 TRC and 0 DART cases for the current year-to-date. The Team did not identify any incentives that would discourage workers from reporting injuries. Interviews with workers indicate they do not fear reprisal for reporting and acknowledge managers encourage the reporting of an injury, incident, near-miss, or first aid case.

The Team conducted a random sampling of WRPS DOE CAIRS database cases. The results indicate the recordkeeper is documenting all injuries and illnesses in the database. Also, WRPS is maintaining complete and accurate recordkeeping logs required by TFC-ESHQ-S_CMLI-C-01, *Injury and Illness Recordkeeping;* and TFC-ESHQ-S_CMLI-C-02, *Injury and Illness Events*, including the OSHA 300 Log, 300A Summary, and comparable 301s. The recordkeeper tracks injury or illness cases using a locally developed spreadsheet and an electronic OSHA 300 Log safety and health database. The recordkeeper posted the OSHA 300A Summary according to the recordkeeping standard during the required periods, and it remains accessible to all personnel throughout the calendar year. The logs reflect the safety and health conditions under this contractor's control. The WRPS recordkeeper has completed CAIRS training and is knowledgeable of the recordkeeping requirements.

Conclusion

WRPS 3-year TRC and DART rates are 93 and 98 percent respectively, lower than the BLS comparison industry average for its NAICS code and meets the expectations for continued DOE-VPP participation.

III. MANAGEMENT LEADERSHIP

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

Since the 2017 DOE-VPP assessment, WRPS leadership has experienced significant changes including senior manager turnover and reassignment, extensive workforce turnover, work scope reprioritization, as well as, external DOE Office of the Inspector General and U.S. Department of Justice investigations prompted by allegations against another Hanford site contractor. Meanwhile, the future downstream recipient of WRPS-processed, tank-stored waste, the WTP, is nearing completion, and WRPS has adapted its leadership team and its workforce from waste-holding tank surveillance and maintenance towards an operating model capable of supporting downstream transfer operations. Presently, WRPS management recognizes that safety must be an operations planning prerequisite to provide its workforce with the best opportunity for success. WRPS managers can leverage existing good practices and safety initiatives but must scale up and increase staff engagement to serve a larger employee base working round-the-clock towards increasingly more challenging priorities.

The WRPS approach to safety and health management policy is adapting to operational mission growth ahead of WTP operation, with WRPS leaders acknowledging the challenge that such a large-scale ramp up poses to long-standing work practices. WRPS outlines compliance with Title 10, Code of Federal Regulations, Part 851 (10 CFR 851), *Worker Safety and Health Program*, through TFC-PLN-47, *Worker Safety and Health Program*. In addition, WRPS complies with DOE Policy 450.4A, *Integrated Safety Management Policy*, through implementation of TFC-PLN-41, *Integrated Safety Management System Description*. High-level policy and program documents have remained consistent for the last 2-3 years. However, documented initiatives provide a more current view of WRPS safety policy and priorities, such as the *WRPS Integrated Strategic Improvement Plan*, a company-wide approach categorizing goals related to “people,” “plant,” and “process,” and the *WRPS Safety Improvement Plan*, an Employee Accident Prevention Council (EAPC)-led approach focused on safety-specific improvement goals. EAPCs are employee-led, safety-focused teams discussed in greater detail later in this report.

During this assessment, WRPS leaders highlighted multiple policy initiatives started within the past year which, despite a relatively short run time, the workforce received positively. However, the Team identified, through document reviews and interviews, that isolated instances of some initiatives had previously existed at WRPS but had not been widely or entirely institutionalized.

The Chief Operating Officer instituted a recent policy initiative, holding a series of "all hands" employee feedback meetings which employees praised during interviews. The 2017 DOE-VPP assessment report though, noted past WRPS efforts to hold small-scale roundtable meetings between employees and the company president.

WRPS highlighted another recent initiative, establishing a *Mission Delivery* organization to drive the WRPS Integrated Strategic Improvement Plan and coordinate other worker engagement groups, such as the Safety Culture Improvement Team and Worker Engagement Committee. The *Mission Delivery* organization is a newly established group which includes responsibilities like worker engagement, Integrated Safety Management System (ISMS), and safety culture. Committee responsibilities and goals in *Mission Delivery* are like the long-standing President's Accident Prevention Council (PAPC), an executive-sponsored performance improvement and injury reduction committee, and the worker-led functional area EAPCs reporting to the president's council. Managers positively described the consolidation of safety and worker engagement improvements under *Mission Delivery* to the Team during interviews.

As noted above, the Team received positive feedback about these new initiatives but recognized significant parallels to other existing efforts. The Team also consistently heard feedback about siloed or stove-piped organizations during the long contract period of tank farm surveillance and maintenance, and functional areas operating independently in a silo which contributes to the apparent repetition of positive policy initiatives. The current policy initiatives have not had sufficient run time to determine their long-term institutionalization or success, but WRPS leaders must be aware of the potential for employee skepticism or confusion when efforts appear repetitive or when initiatives overlap.

Opportunity for Improvement:

WRPS leaders should carefully consider the scope of existing safety policies and programs when implementing new initiatives to prevent duplication of resources and goals while incorporating past good practices and lessons learned. Consider opportunities to modify and improve existing programs versus layering additional initiatives to avoid diluting positive efforts.

The Team discussed with WRPS leaders and staff the adequacy of the safety and health program and the safety organization's ability to support operations. Employees consistently responded positively about the availability of safety, IH, and radiological control professionals and technicians in the field and the high quality of interactions with these support personnel. To support the steadily increasing work scope, WRPS addresses the industry-wide shortage of radiological control technicians by training new staff internally or hiring experienced workers from other Hanford site contractors when they encounter periods of reduced workload. WRPS managers and workers also noted instances of funding being applied to safety initiatives or specialty areas such as enhancing fire protection expertise to address aging infrastructure issues. Future WTP operations will increasingly challenge WRPS to maintain operational readiness by encouraging strong planning and feedback within its operating processes and giving leaders information needed to right-size safety and health staffing.

WRPS line organizations indicated an understanding of their responsibility to ensure worker safety during operations and were candid during interviews about how a transition towards around-the-clock operations and increased waste throughput will challenge existing safe work practices. The Team has observed initiatives across the DOE complex which can serve as health indicators of line responsibility for safety, such as employee-led safety team participation and worker-submitted safety observations. The Team met with employees from multiple functional areas, including several employees with 5 years or greater experience in production operations, and discussed EAPC participation and *My SafetyFocus* entries, a WRPS mechanism for worker-submitted safety observations described in greater detail later in this report.

These experienced employees were frequently noted by colleagues as "go to" workers for advice and examples of reliable work completion. All experienced employees interviewed indicated a strong personal motivation for working safely, but several responded that they did not regularly attend EAPC meetings and had not personally submitted *My SafetyFocus* entries. All employees indicated that they are allowed to participate in these initiatives by their managers, but many, including the "go to" workers, said that they generally prioritized their workload or other schedule constraints over commuting to EAPC meetings.

The Team also compared interview feedback to an observed production operations and maintenance EAPC meeting which highlighted their March 2024 *My SafetyFocus* entries. Out of 897 EAPC members, only 10 individuals submitted a total of 64 entries.

The Team heard no instances of management causing direct barriers to employee participation. However, employee participation will become more challenging with future production increases and a larger employee population working 12-hour shifts not directly aligned with standard support organization day shifts. Employees having long tenure and recognized by their peers for work ethic and safe work practices are generally valuable voices for a line organization focused on safety.

Opportunity for Improvement:

WRPS leaders should consider positive reinforcement techniques and EAPC reorganization and resizing as mechanisms to broaden employee participation in EAPC initiatives such as *My SafetyFocus*, and make meetings more accessible, particularly to operations personnel transitioning to shift schedules.

WRPS leaders interviewed during this assessment recognize that constant and consistent communication is critical to navigating changes such as contract transition, employee turnover, and operations ramp-up. WRPS managers also understand that visibility and accessibility to employees ensures that communication lines remain open.

The WRPS *Mission Delivery* organization developed a brief engagement feedback form, accessible online via a quick response code, as a tracking tool to allow leaders to recognize the frequency of their employee interactions while also logging key observations for trend analysis. The tool has been well received by managers based on Team discussions, and accurate data on

engagement frequency can be compared to employee feedback or other operational performance indicators to help determine management impact.

The Team also heard positive feedback about the previously mentioned recent reinvigoration of "all hands" employee meetings by the Chief Operating Officer. Both managers and employees noted during interviews that these meetings not only made a new senior manager appear more approachable to employees but also boosted leadership credibility when managers visibly recorded "all hands" meeting feedback, acted upon it, and followed up with status reports in subsequent meetings.

The Team also had the opportunity to discuss engineering organization roundtable initiatives and attend one such meeting during the assessment. The Team observed good information sharing from engineering managers to a diverse set of engineers from multiple disciplines and functional areas with widely varying tenure and experience levels. At the end of the meeting, participating engineers organically demonstrated the significant value of the meeting when relatively inexperienced, previously unacquainted, instrumentation engineers connected with a more experienced engineer who they met during the meeting to discuss technical questions. Creating a meeting environment conducive to knowledge sharing and employee engagement can be challenging, and the engineering organization demonstrated what the Team observed to be a best practice in its roundtable approach. Current and future WRPS managers will benefit from efforts to institutionalize the positive initiatives of strong leaders to ensure the workforce and organizational safety culture continue to benefit past individual managers' tenure.

The Team walked through WRPS operational processes and met workers at facilities, such as the 242-A Evaporator, Tank Side Cesium Removal (TSCR), and the ETF, during the assessment to gather feedback on how the transition to full WTP operations support and around-the-clock shift operations would affect each operations group. The Team heard some frustration from workers that there was still uncertainty regarding what specific roles and positions would be impacted by a change to 12-hour shifts. The Team also heard concerns that an integrated schedule incorporating all WRPS operational areas had not been fully established. Senior leaders expressed hope that they could familiarize the workforce with downstream process demand and staggered outage planning in preparation for WTP support, but noted that it is challenging to illustrate schedule constraints to workers when an integrated schedule does not exist.

The Team also heard discussions regarding the exercise of formal stop work authority and restart processes with greater frequency than is typical at other DOE-VPP participant sites. Although the ability to exercise stop work authority is a critical element of a safety conscious work environment and required by DOE regulation, the relative frequency of invoking the formal stop work process, versus a more informal work pause to ask questions, appeared to be a last resort in place of adequate job planning and work group communication. For example, the TSCR process is a very complex contaminated waste treatment process requiring hands-on, worker-intensive maintenance outage work between waste processing cycles. The cesium removal process is a pilot project expanded to regular operations. The system maintenance and turnover involves radiological, ergonomic, and industrial hazards in a confined environment. The Team heard worker and manager feedback from the last 2 years of cesium removal operations which included positive views of post-job lessons-learned incorporation but negative views of comprehensive preplanning engaging all key stakeholders and workers.

Workers and managers described to the Team a formal TSCR stop work in 2023 which managers did not clearly satisfy worker concerns regarding As Low As Reasonably Achievable dose exposure and mitigation measures. The formal stop work did successfully achieve the goal of increased job discussion and expedited procurement of parts which further reduced the relatively low dose exposure levels of the job. Worker reliance on issuing a formal stop work to achieve a revisit of process work planning, however, leaves a lasting viewpoint that addressing concerns will require extreme measures. Preplanning mechanisms are critical means for managers and planners to receive and satisfy worker input before workers feel like a formal stop-work is their only option and create a more collaborative work environment.

Opportunity for Improvement:

WRPS should increase emphasis on advance planning tools such as worker-led pre-job briefings, tabletop exercises, and walkthroughs with workers specifically assigned to the planned task to consistently create the best possible environment for understanding roles and responsibilities and encourage operational buy-in from all stakeholders.

WRPS leaders frequently and directly engage with bargaining unit leaders affiliated with the Hanford Atomic Metal Trades Council (HAMTC) and Central Washington Building and Construction Trades Council to ensure worker concerns are communicated and addressed. The WRPS Labor Relations manager works closely with bargaining unit representatives and connects with other DOE complex labor relations leaders to share lessons learned. The Team met with HAMTC leadership who emphasized the importance of DOE-VPP to HAMTC and its affiliated workers as a means of ensuring worker safety remains a priority with WRPS and other Hanford Site contractors. WRPS also employs HAMTC Safety Representatives who serve as advocates for craft workers and an extension of those workers' right to raise concerns in a safety conscious work environment. The Team met with HAMTC safety representatives who, in addition to general employee advocacy, are heavily active in EAPC activities and safety walkdowns. HAMTC Safety Representatives track formal "stop works" avoided due to early interventions as a leading indicator. HAMTC and WRPS have collaborated on long-term safety concerns such as tank vapor protections and supply of cold weather gear to workers, highlighting the importance of successful WRPS labor relation.

Subcontractors working for WRPS receive clear safety expectations and thorough oversight to ensure subcontract workers are familiar with job-specific hazards and employ appropriate controls. WRPS supplements subcontract oversight by utilizing Building Trades Safety Representatives, union advocates from various building and construction trades who act as staff augmentation to the WRPS environment, health, safety and quality organization and serve as a key conduit between subcontract workers and WRPS leadership.

The Team met with Building Trades Safety Representatives to discuss their role and challenges unique to subcontracted construction work. Higher turnover relative to direct-hire WRPS positions and job scopes presents a challenge establishing an effective safety culture among contractors. The largest subcontractor employed by WRPS, American Electric Inc., has a reputation of successful work completion. The Team met with American Electric Inc.

construction and safety leaders who credited a strong safety culture and safety focus for the company's longevity at the Hanford Site. Larger subcontractors like American Electric Inc. employ safety professionals directly, so Building Trades Safety Representatives can coordinate with those personnel while providing more direct oversight and engagement with smaller subcontractors. For example, Building Trades Safety Representatives can escalate concerns regarding contract safety requirement fulfillment like provision of required personal protective equipment (PPE) when subcontractors push back. WRPS recognizes the risk posed by subcontracted work activities and workers who are not thoroughly indoctrinated in site safety expectations and has leveraged a DOE-complex best practice of bargaining unit safety representative roles to supplement its subcontractor oversight function and advocate for subcontract worker safety.

WRPS leaders have pursued organizational improvement by performing surveys, self-assessments, and other effectiveness analyses. For example, a few days prior to this assessment, WRPS underwent a reorganization of senior leader roles and responsibilities. The reorganization was the result of careful internal analysis of current manager workload and employee ratios relative to where WRPS operations needed to shift to for future WTP support. One organization change was the redistribution of several significant operations including TSCR, 242-A Evaporator, ETF, and others previously overseen by a single senior manager. These processes will heavily increase staffing and process throughput to support WTP, becoming unrealistic for one senior manager to effectively manage with the desired level of employee engagement and oversight. The whole organization benefits from a general consideration that "right-sizing" manager-employee ratios encourages effective leadership. Additional examples of WRPS self-reflection include recent company-wide safety culture surveys facilitated by Oak Ridge Associated Universities, environment, health, safety and quality organizational culture and leadership surveys, subcontract environment, health, safety and quality flow-down requirement self-assessment, and the WRPS annual DOE-VPP report submittal. The Team observed thorough analysis of self-assessments and WRPS staff at multiple levels reinforcing the value of feedback mechanisms towards safety excellence.

Conclusion

WRPS leaders recognize their key role in preparing the workforce for the future WTP support mission, and they rely on a strong safety culture among the workforce and the application of Integrated Safety Management (ISM) to continuously improve the organization towards that future mission. Senior managers demonstrate their commitment to ISM by engaging with the workforce to clearly communicate safety policy, expectations, and operational priorities, and track such engagement to draw conclusions on its effectiveness. WRPS leaders have made safety a prerequisite for strategic planning and are investing in safety and health resources and initiatives to help operations organizations maintain safety responsibility while ramping towards widespread around-the-clock shift operations. Managers have pursued opportunities such as "all hands" meetings and employee roundtable discussions to emphasize visibility and credibility. Subcontractors receive the tools, information, and oversight required to work safely on WRPS scope. WRPS leaders have increased efforts to self-reflect and assess safety culture using various surveys and reviews. WRPS has opportunities to improve alignment and cohesion of new and existing safety initiatives, encourage employee-led safety team participation by influential

workers, and increase emphasis on advance work planning and communication. WRPS meets the expectations for Management Leadership and continued participation in DOE-VPP.

IV. EMPLOYEE INVOLVEMENT

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

In 2017, the VPP team concluded that WRPS had demonstrated efforts to improve employee involvement and ownership of the safety and health program. WRPS had a well-established structure of safety committees and councils. WRPS maintained a wide array of employee recognition programs that promoted recognition and reinforced safe behaviors demonstrated by individuals or teams. The 2017 VPP report recommended that WRPS should continue its focus on improving the EAPC participation rate by workers and consider identifying a VPP Champion to lead VPP initiatives and help EAPCs and other committees integrate continuous improvement activities.

The WRPS PAPC is WRPS's safety leadership council. The EAPCs, As Low As Reasonably Achievable Committee, and Standing Committees (Committees established by WRPS Level 1 Managers to meet a specific goal or objective as circumstances warrant) report concerns to the PAPC on a quarterly basis. Documentation provides the expectation that these safety committees and councils provide a partnership between bargaining unit, exempt, non-exempt employees and management, to evaluate and develop solutions to improve safety performance and reduce injury and illnesses through the application of DOE-VPP principles and the ISMS structure within WRPS.

WRPS held no PAPC meetings during the virtual or onsite review period for the Team to participate in or observe. Therefore, the Team reviewed the last 2 years of PAPC team meeting minutes. All PAPC meetings reviewed included the PAPC teams' discussion of "safety moments", the recognition of employees for the president's safety nominations, and the discussions of the four EAPC committee meeting content and concerns. The discussions of the EAPC meeting were detailed and demonstrated that PAPC personnel were well informed of the EAPC groups' employee concerns. The Team's review confirmed the PAPC is effectively soliciting and pursuing any information related to employee concerns. The PAPC meetings are well organized and provide the WRPS leadership valuable information related to other committee identified concerns.

WRPS EAPC charters support the effectiveness of company and organization-specific safety programs by implementing activities designed to improve safety performance, employee involvement, wellness, and behavioral based safety. The WRPS EAPC charter describes the expectation that the EAPC "will serve as a forum to resolve safety concerns and issues through normal channels, recommend ways to eliminate or correct hazards and unsafe work practices and supports communication between the submitter of a concern or issue and management to ensure

effective corrective actions are implemented promptly, monitoring progress of issue resolution." The Team observed meetings of all four EAPCs during either the virtual or onsite sections of the assessment and found them to be well organized, with a detailed agenda and informative speakers or discussion points. The EAPC members were enthusiastically participating in the discussions and issues raised by members were discussed and tracked to closure.

The Production Operations and Maintenance EAPC is the largest of the EAPCs, therefore active discussions amongst the members was limited compared to the other EAPCs (due to time constraints and the number of organizations the EAPC represents). The Team believes that the Production Operations and Maintenance EAPC is very productive but recognized that members did not demonstrate the same level of interaction compared to other EAPCs.

While the Team was onsite, WRPS was considering restructuring the EAPC's in anticipation of combining tank farms with WTP operations. The discussions focused on physically re-positioning the current EAPC committees and decreasing EAPCs from four to two but expanding the number of co-chairs within those EAPCs to ensure representation of all sub organizations. The Team is concerned that reducing the number of EAPCs will reduce EAPC committee member spontaneous discussions as noted in the Production Operations and Maintenance EAPC committee.

Opportunity for Improvement:

WRPS should consider expanding the number of EAPCs as opposed to combining EAPCs to accommodate the WTP activities utilizing video conferencing for remote locations to ensure to member participation.

WRPS developed the *My SafetyFocus* card for employees to provide safety related input to the EAPC. WRPS employees can submit *My SafetyFocus* cards input on card or electronically through a phone app. The EAPC committees track and trend *My SafetyFocus* card information providing analysis at the EAPC monthly meeting.

The EAPCs maintain Safety Books in convenient locations for employees to submit concerns in writing. The Safety Book approach is an effective method to provide workers the opportunity to raise concerns anonymously. The Safety Books are managed and maintained by an elected member of an EAPC and entries are tracked and discussed in EAPC meetings.

The Team interviewed several of the EAPC chairs and co-chairs finding them to be energetic and invested in the success of their councils. The interviewed chairs and co-chairs stated they were relatively new to WRPS but wanted to help provide a safe work environment for their coworkers. The staffing of the EAPCs is effective and helps ensure that more than one or two people are performing all the work supporting the council.

The EAPC charters provide the chair and co-chair the ability to select volunteers to staff multiple positions related to the EAPC activities. The volunteers are permitted to log their EAPC support on their timecards. WRPS provides a budget of approximately $20 per person within the EAPC.

The EAPCs use the budget to conduct safety initiatives, usually twice a year. For example, one EAPC is developing a Mental Health Initiative for this spring. In addition, the EAPCs endorse safety campaigns by developing puzzles or games related to campaign themes and provide prizes to the employees.

The WRPS VPP Steering Committee's primary focus is increasing awareness of VPP. Opportunities for participation are presented to employees through VPP monthly or quarterly campaigns and initiatives. The VPP program provides employees the ability to participate in multiple committees that encourage input from workers to WRPS management for the purpose of improving worker safety and identifying work process improvements without fear of reprisal. The VPP program recognizes employees for identifying potential hazards and work process improvements. The VPP Committee works continuously to pursue new methods to improve the effectiveness of the VPP program ensuring that the VPP program develops and adjusts as the program progresses.

WRPS utilizes various forms of communication techniques to spread messaging throughout the site as verified during the onsite review interviews of employees. WRPS recognized that messaging needs to be provided through multiple media channels to reach all members of the workforce effectively. The Team identified that some of those communications methods include the *Solutions* weekly newsletter, delivered both electronically and hard copy to all work areas, emails from senior managers, monthly news cast videos, signs, banners, and posters. The employees interviewed by the Team indicated that the communications were adequate, although some workers stated that e-mailed communications did not always reach all craft personnel. Overall, there is a positive sentiment by WRPS employees towards WRPS communications.

The EAPCs provide direct communications to members including area-specific newsletters, emails from committee chairs, co-chairs, and organization heads, and informal communications. Although communication with such a large workforce spread over a large geographic area can be difficult, WRPS has made a concerted effort to reach out to all employees. Overall, the WRPS employees interviewed by the Team indicated that they are well informed of the hazards associated with their work and believed they were empowered to question or even stop any work activity that they believed was unsafe or not properly analyzed.

Conclusion

WRPS continues to maintain a well-established structure of safety committees and councils established by the PAPC to seek, identify, and resolve employee concerns. WRPS employees continue to indicate they are well informed of workplace hazards and are empowered to stop work if necessary. An OFI regarding the expansion of EAPCs to accommodate the WTP operations was identified. WRPS continues to meet the expectations for Employee Involvement for DOE-VPP participation.

V. WORKSITE ANALYSIS

Management of safety and health programs begins with a thorough understanding of all hazards that workers might encounter during work, and the ability to recognize, evaluate, and control 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 work as work planners use the results of the analysis in subsequent work planning efforts. Effective safety programs integrate feedback from workers regarding hazards and include a system to address newly recognized hazards. Successful worksite analysis also involves implementing mitigating measures during work planning to anticipate and minimize the impact of hazards.

The 2017 assessment concluded that WRPS faced many challenging hazards that needed to be analyzed to develop control strategies to protect workers, the public, and the environment. The work control process integrated the sampling and industrial hygiene analyses results into work instructions, procedures, and training. The improved use of scientific methods and field equipment raised confidence among the safety and health community and workers that solutions are acceptable.

Building upon the refinements in the work control process, WRPS planners have developed an extensive worksite analysis program. The planners use both Job Hazard Analysis (JHA) and General Hazard Analysis (GHA) methods to evaluate the hazards associated with work activities. The GHA is a list of common hazards WRPS personnel may encounter. All employees receive training on GHA, providing workers with the knowledge of controls to work safely. JHAs evaluate all aspects of work areas and task performance. Controls for the hazards become part of the work control documents as appropriate. Planners address JHA hazards associated with the work activity through appropriate permits.

WRPS embraces technology to improve its ability to keep workers safe. The automated Employee Job Task Analysis (EJTA) program is an example of how technology has improved worker safety. The IH department monitors the EJTA program software and works with subject matter experts (SME) to develop and maintain the listing of EJTAs. Workers have access to their file and may review and request the IH department to edit the information at any time. The EJTA provides an evaluation of the task and hazards workers may encounter while performing their job. Any worker, including subcontractors, exposed to a hazard as part of performing a task or being on site longer than 30 days must have an EJTA. The EJTA analysis assists the medical department to ensure applicable medical surveillance and testing is implemented. The medical department will not perform a physical examination of any employee without a current EJTA.

WRPS uses several levels of work packages to manage hazards, analysis, and controls. The GHA identifies routine industrial safety and hygiene hazards where employee training and knowledge are considered sufficient to implement skill-based controls. These skill-based controls are not normally incorporated into work documents, so the GHA is reviewed at pre-job briefings when hazards and controls for work activities are covered by the GHA. For routine or repetitive work activities, the GHA is reviewed prior to the first performance and at least monthly thereafter. The GHA, along with a list of Level 4 work activities, allow work planners to maintain consistency.

The next complexity of work is Level 3, or skill-of-the-craft activities. As with Level 4 work, WRPS SME developed lists of approved activities each craft may perform based on education or training specific to the craft. The work management website maintains a list of skill-of-the-craft activities. Occasionally, Level 3 work activities may have hazards that need additional analysis. A JHA checklist assists the planning team with the analysis unless a standing JHA is available. TFCOPS-MAINT-C-01 contains criteria for Level 3 and 4 work to ensure work packages are within their respective scope. TFCOPS-MAINT-STD-03, *Tank Operations Contractor Skill of the Craft,* describes the process to change the activities listed on the skill-of-the-craft or the Level 4 activities table. These processes provide an efficient method to ensure WRPS identifies and analyzes all hazards for routine work prior to the start of work.

Level 1 or 2 are complex work packages. The activities within these work packages may be highly complex, have high hazard or consequences, and likely involve using complex hazard controls. For Level 1 work packages, planning teams walk down the work to define the scope, develop the JHA, develop the work instructions, and verify workability. Level 2 work packages are approved procedures or previously approved work instructions and may require only field walkdowns of the work. If changes to work packages occur, the Level 2 will revert to a Level 1 planning process. TFC-OPS-MAINT-C-01 contains criteria for Level 1 and 2 work to ensure work packages are within their respective scope, and the required SMEs provide reviews. To assist in the development of work instructions or procedures for work packages, the planning team uses the JHA checklist per TFC-ESHQ-S-SAF-C-02, Job Hazard Analysis. The checklist reviews 30 required activities for WRPS, with space to add more activities. After the analysis of each activity, the planning team selects the control or adds additional comments in the control section. The WRPS work control program is well established and staffed with an adequate number of planners. Planners have a 3 to 6-month training period and receive approval from the work control program manager following an extensive oral board. The program takes a graded approach to work control, using standard risk analysis techniques and the highly trained skill of the craft. Managers and workers regularly perform routine hazard verifications or hazard walkdowns, often accompanied by safety professionals.

The Safety and IH department develops and maintains a Risk Register which includes recommendations for the Integrated Assessment Schedule. The register derives from evaluation of Safety and IH functional area components such as performance history. (e.g., number and recurrence of issues), baseline surveys, facility hazard surveys, and the collective significance and trending of issues identified in the integrated contractor assessment system. Performance indicators, safety and health surveillances, and previous assessments are key components of the register.

The results of the Risk Register feed into the Integrated Assessment Schedule. The Safety and IH management team reviews progress using the Risk Register. At least annually, the Safety and IH management team meets to review progress in relation to the Risk Register, and to discuss and implement any changes to the schedule or establish assessment focus areas based on trends, site-wide issues, and forward-looking topics.

WRPS has taken a conservative and innovative approach to work planning related to tank farm activities. The Cold Test Facility (CTF) is a state-of-the-art mockup used to train tank farm workers and qualify operators in a safe, clean, controlled environment. The mock-up

significantly reduces the risk of a mistake relative to an actual work environment containing industrial and radiological hazards. The test facility allows WRPS to test new tools and process improvement techniques such as robotic arms, retrieval tools, leak detection, camera systems, tank repair systems, vacuum retrieval systems, and laser volume measurement systems. A notable process improvement proven at CTF is the Tank Dome Core Cutting System. This process uses a mechanical boring and cutting tool to replace hand digging to reach underground tank domes and install risers. CTF has a full-scale replica of an above ground 75-foot diameter tank simulating the tanks onsite.

The Team observed new operators learning to use a camera in a tank. At the CTF, operators can train without excessive noise that often challenges communication during actual tank farm work. The Team noted the extensive and detailed mockup use at CTF to be a best practice for improving job planning, worker preparation, and hazard analysis while reducing potential worker hazard exposure.

WRPS conducts accident and incident investigations in accordance with TFC-OPS-OPER-C-14, *Event Investigation Process*. The process drives examination of events, conditions, near-misses, or other indications of situations which could adversely affect safety, health, quality, or the environment. These criteria apply to internally managed event investigations and externally driven accident investigations performed in accordance with DOE Order 225.1B, *Accident Investigations*.

An Event Investigation Report is normally issued within 15 working days following initiation of an event investigation. The Event Investigation Report may change as needed to communicate new information with the same approvals and distribution. If there are no criteria for continuing the event investigation, the process ends with the issuance of an Event Summary, and completion of identified corrective actions. Investigations use SMEs to interpret and provide context for the data/records collected and facility, system, and process configurations. The Team noted the personnel responsible for the issues management and analysis are well versed in a variety of analysis techniques. A review of several root cause and apparent cause analyses showed attention to detail and a willingness to dig deep to find the root of an issue. The reports were comprehensive and professional.

The EAPC Safety Book serves to identify safety activities or conditions that require correction and opportunities for improvement, while recognizing both individual and project safety successes. The EAPC Safety Book is an available avenue for employees to report observed safety issues or conditions (positive and negative) without fear of reprisal. The book is effective, and offers anonymity, to the reporting originator if desired, and provides an avenue of feedback.

The Safety Book owner places the EAPC Safety Book in a common area that is freely available to employees and informs employees of the location. The EAPC Safety Book is not a replacement for immediate notification to supervisors for situations or conditions that require immediate action or implementation of the Stop Work process. For Action Requests generated for documented Safety Book concerns prior to the concerns being open for 60 days, the concerns or issues in the Safety Book close on the date the Action Request was initiated. This process allows tracking of the concerns or issues by one system.

When an issue is resolved to the satisfaction of the concerned individual, the Book Owner completes the resolution field of Safety Book Detail Sheet and obtains the originator and action officer's completion signatures. If the issue resolution does not satisfy the concerned individual, the Safety Book Owner forwards the issue to the EAPC co-chairs, Union Safety Representative, EAPC Management Representative, and Safety Representative, who come to a consensus. The EAPC Safety Book SME submits an Action Request documenting closed issues for trending purposes every 90 days or less, while developing and maintaining a safety metric. The Safety Book SME also reviews new entries sent from Safety Book owners, entering them into the database published on the WRPS intranet.

Another avenue for addressing hazards and concerns is the *My SafetyFocus* card. The cards work in a similar manner as the EAPC Safety Book. The cards are available in work areas and given to an EAPC member or placed in a *My SafetyFocus* drop box for action. The cards have an added feature of a quick response code, allowing employees to fill out and submit their concerns electronically. Based on submission numbers, the quick response code option is the preferred method of submitting identified hazards and concerns.

Conclusion

WRPS work control processes integrate safety analysis results into work instructions, procedures, and training. Everyone interviewed expressed a solid understanding of worksite analysis and how their work is part of the process. Operational processes and procedures, such as the GHA and JHA, accident and incident investigation, and work planning receive updates and evaluations on a regular basis. Workers are highly trained and competent to perform their work. Workers use multiple methods to identify hazards and concerns taking an active role in the process. The site is a safety conscious work environment, and employees feel safe expressing any safety concerns. WRPS continues to meet the expectations for Worksite Analysis.

VI. HAZARD PREVENTION AND CONTROL

The third and fourth core functions of ISMS, identify and implement controls and perform work in accordance with controls, ensure that hazards are eliminated by substitution or changing work methods once identified and analyzed or addressed by the implementation of engineering and administrative controls, or PPE. Equipment maintenance processes are also considered to ensure requirement compliance. Additionally, emergency preparedness plans must be implemented to respond to and mitigate the impact of incidents. Safety rules and work procedures must be developed, communicated, and understood by supervisors and employees. These rules and procedures must be followed by everyone in the workplace to prevent, control the frequency of, and reduce the severity of mishaps.

Since the 2017 DOE-VPP Assessment, WRPS continues to use the hierarchy of controls to eliminate hazards whenever possible to reduce worker exposure. The use of engineered controls, improvements in administrative controls, and the expanded use of meteorological sensors and reader boards help track environmental conditions and inform workers of hazardous operations. WRPS's continuous improvement culture is evident in the implementation of the *242-A Evaporator Campaign EC-11* meant to improve the vapor protection strategy at the tank farm. This vapor protection strategy combines the use of reader boards that notify road traffic when "Waste Disturbing Activity in Progress" alongside IH area sample location monitoring devices and public announcement speakers throughout the facilities to keep workers informed.

WRPS' support of the IH staff with resources such as equipment and sampling media and continued commitment to vapor monitoring have improved response time to vapor exposures and their characterization, a prevalent issue in the management of the tank farms. Tank vapors are managed through addition of engineering and administrative controls to protect worker safety and health through mitigation of a potentially hazardous work environment at WRPS. IH technicians (IHT) collect approximately 300 monitoring samples daily which are sent offsite for analysis; these samples offer a verification of effective worker protection through the controls established. The Team performed a walkdown of the main IHT laboratory and interviewed multiple employees who appeared willing and unafraid to share their thoughts, ideas, and challenges of performing their jobs.

WRPS employs the following engineering controls to mitigate vapors associated hazards: vapor monitoring and detection, vapor exhaust stack extensions, carbon adsorption filtration using activated C-103 Carbtrol™, and radial high efficiency particulate air and high efficiency gas adsorber filtration. These engineering controls allow WRPS to control vapor emissions through filtering and constant monitoring, while measuring and quantifying tank vapors to determine potential employee exposure. In addition, workers who enter the tank farm must wear a personal ammonia monitor to notify them of a potential exposure to chemicals of potential concern. Ammonia monitors are programed to alarm at 6 parts per million at the low level and 12 parts per million at the high level. WRPS set the monitor sensor parameters after conducting a qualitative risk assessment of ammonia exposure for an individual standing at ground level. WRPS also utilizes specialty long-reach tools to keep workers at a distance from hazards when collecting samples, installing sheathing, and disconnect jumpers. In addition, WRPS has tasked the Pacific Northwest National Laboratory with independent validation to confirm the broad

efficacy of vapor cartridges currently used at the Tank Farm in worker protection from multiple chemicals of potential concern and longer durations. The use of engineering and administrative controls in conjunction with WRPS continuous improvement mentality, as illustrated by its collaboration with Pacific Northwest National Laboratory, clearly demonstrates the organization's commitment to employee safety.

The Team observed adequate tracking and trending of hazards and deficiencies via the integrated contractor assurance system. WRPS classifies hazardous conditions at WRPS by a severity rating to allow for better classification of leading indicators and reduce overreliance on lagging indicators whenever possible.

WRPS shares lessons learned among employees via emails and website postings. The lessons learned program coordinator also shares applicable DOE Occurrence Reporting and Processing System issues and DOE complex-wide lessons learned with WRPS employees. WRPS also utilizes benchmarking techniques among different facilities or organizations to ensure a consistent approach to implementing and sharing of lessons learned.

The Team discussed with WRPS staff various hazard assessment and workplace inspection methods used by managers, safety professionals, and workers. Despite clear evidence that hazard inspections occur, the Team observed multiple hazards during facility walkthroughs, including blocked access to electrical disconnect switches, inadequate housekeeping, improper storage of a fire extinguisher, daisy chained extension cords, inadequate width of walkways, tripping hazards, and blocked exit doors.

Opportunity for Improvement:

WRPS should review workplace inspection policies, procedures, training, and qualification requirements to ensure individuals conducting workplace inspections are familiar with common safety hazards and applicable abatement methods.

The Team reviewed a sampling of WRPS IH program procedures and practices, including noise control and hearing conservation, silica control, and chemical hazard communication. Document reviews and walkdowns identified instances where stated program parameters did not clearly align with regulatory requirements. Examples include:

- TFC-ESHQ-IH-STD-18, REV B-0, *Noise Identification and Hearing Conservation Program:*
    - Referred to the American Conference of Governmental Industrial Hygienists exposure threshold limit values as a "guideline" and "recommendations" instead of requirements as mandated by 10 CFR 851.
    - Does not include a provision that employees need to have 14 hours without workplace noise exposure immediately prior to their baseline audiogram, or they must wear hearing protection prior to their baseline as mandated by 10 CFR 851.

- SWIHD 23-06828, for AP 06 A pit core drilling. In this survey, WRPS monitored an employee for respirable crystalline silica exposure, and the report indicates that engineering controls included "barrier, mechanical ventilation (fixed), and wet methods." However, the report does not specify the sampling methodology, does not list the name of the laboratory providing the sample analysis used in the report, and does not include specific information about the controls utilized during the pit core drilling. For example, WRPS should include a description of the "wet method" used during the Pit Core Drilling in the comments section of the report generated from the site-wide IH database. Information such as sampling methodology, laboratory performing analysis, and control method details provides better visibility when validating the collected sampling data and verifying the implementation of controls for the monitored activity.

- TFC-ESHQ-IH-C-02, REV B-2, *Hazard Communication Program.* WRPS did not clearly provide chemical hazard information as prescribed by their affecting two large chemical supply tanks on the exterior of the ETF for 92 percent sulfuric acid (65C-TK-1) and 50 percent sodium hydroxide (65C-TK-2) and two smaller storage tanks containing 4 percent sulfuric acid and 4 percent sodium hydroxide located inside the ETF.

Opportunity for Improvement:

WRPS should review the safety program documents associated with the Hearing Conservation Program, Silica Program, and Hazard Communication Program to ensure that the programs clearly demonstrate and document compliance with their associated regulatory requirements.

WRPS safely performs preventive and predictive maintenance activities as scheduled. The Enterprise Asset Management (EAM) software tracks maintenance activity due dates based on their periodicity, and work orders could be view up to 90 days in advance. Physical work orders are printed with applicable procedures and any additional controls as needed to mitigate hazards. Standing work orders are utilized for repetitive work activities to make use of skill of the craft and expedite work operations.

The Team observed a tracking and trending system of maintenance activities that relies on old hardcopies of work orders and the downloading and printing of documents from EAM. This methodology does not promote a streamlined process of tracking and trending of issues during maintenance activities. EAM has a mobile platform available that could help expediate and streamline work package issuance at WRPS and ensure that employees are working from the latest procedures at all times.

Opportunity for Improvement:

WRPS should consider utilizing the EAM mobile platform to add the capability of accessing and entering data in real time during maintenance operations.

The implementation of the EAM mobile platform should provide workers with on-the-go access to work orders and required maintenance procedures instead of relying on physical printouts. The EAM mobile platform should provide the ability to capture field notes and potential lessons learned in real-time, which makes it easier to identify reoccurring equipment issues. The Team concluded that preventive and predictive maintenance activities at WRPS are adequate and performed within applicable regulations, but the implementation of the EAM mobile platform could streamline the overall efficiency of maintenance activities.

Inomedic Health Applications, Inc. (IHA) provides medical services for WRPS employees in accordance with 10 CFR 851 requirement and regulations. The IHA staff includes three medical doctors, four physician assistants, two exercise physiologists working alongside nurses, psychologists, and other support staff. IHA conducts initial and annual workers' physicals, medical surveillance programs, and manages the drug test program for WRPS employees. IHA makes available to WRPS employees the following wellness programs: telehealth, wellness webinars, health challenges, and health coaching sections. IHA sends a newsletter via email to WRPS employees advertising upcoming health services and initiatives. IHA has also placed in service a new patient portal kiosk named *My Cority*, where employees can access their work-related medical records and print copies if needed.

During a walkdown of the medical clinic located at 1979 Snyder Street, the Team observed the newly installed Local Exhaust Ventilation systems utilized during pulmonary function testing to reduce the spreading of harmful airborne particles or viruses. The utilization of this ventilation system exemplifies a best practice among DOE site clinics when performing spirometry testing as it helps protect the clinical staff and patients from airborne contaminants.

WRPS employees also benefit from IHA's utilization of an industrial rehabilitation room where EJTA is performed to determine a worker's ability to perform specific work tasks such as reaching equipment controls, climbing ladders, and turning knobs. In response to injuries, IHA provides only first-aid and initial emergency care. WRPS transports employees requiring more specialized care to Kadlec Regional Medical Center, a Level II Trauma Center. The Team concluded that employee medical services at WRPS are adequate and performed within applicable regulations.

WRPS utilizes a combination of emergency management procedures and contractor requirement documents to implement DOE Order 151.1D, *Comprehensive Emergency Management System.* WRPS adheres to DOE-Richland Operations Office (RL) DOE/RL-94-02, *Hanford Emergency Management Plan*, and DOE-0223, *Emergency Plan Implementing Procedures* (prefixed as 'RLEP,' for RL Emergency Procedure) that establish the emergency preparedness requirements for all operating contractors at the Hanford Site. WRPS regularly conducts coordinated drills that involve WRPS employees and other contractors at the Hanford Site.

Hanford Mission Integration Solutions (HMIS), as the site-infrastructure support contractor, provides fire department operations and ambulance service to the entire Hanford Site. WRPS staff work in collaboration with HMIS emergency preparedness staff to ensure adequate communication and implementation of emergency procedures among WRPS employees.

During the onsite visit, Team members attended a predrill briefing and participated as observers during a collaborative Protective Action Drill for the 100, 200 East and 200 West areas. WRPS

evaluated employees for consistent implementation of emergency procedures at the different facilities. The building warden questioned employees regarding the specific steps necessary to secure the different facilities and provided feedback to employees when needed to ensure a continuous learning environment. The facility-securing steps included the proper procedures needed to shut down the building ventilation and ensure that at least one employee was guarding the buildings entryways to prevent building entry after the sounding of the alarm. The drill appeared well organized, and employees understood their roles in ensuring their personal and co-workers' safety. WRPS conducted the Protective Action Drill in accordance with the procedures discussed during the predrill briefing.

In addition to the drill observed by the Team, WRPS performs enhanced operations drills, monthly drills, and other collaborative drills with Hanford site contractors to ensure the safety of onsite employees. There are a total of six prime contractors working on the Hanford site, and collaboration among all contractors is crucial to ensure workers safety.

WRPS provides all occupied buildings with an emergency preparedness bulletin board that provides contact information for area wardens, emergency numbers, evacuation routes, the location of assembly areas, a list of building hazards, and the location of utility disconnects. Team interviews with WRPS emergency management personnel confirmed a proactive approach to the implementation of the emergency management plan and communication of the plan's requirements to employees. WRPS has also implemented a roadside signage and wrapping of vehicles with safety messages campaign to help reduce the number of vehicular onsite accidents and the need to utilize emergency management resources to attend such incidents.

WRPS maintains sufficient qualified professionals as resources to workers for safety and health needs and encourages participation in certification programs to create a culture of continuous learning. The combination of certified professionals with the utilization of positive reinforcement programs, such as the high five, safety logbooks, peer safety recognition award, and safety focus cards, create a work culture where employees can raise concerns and be rewarded for their initiative in creating a safe work environment while expecting reported issues to be handled in a timely manner by qualified safety professionals. WRPS performs an adequate job of utilizing safety and health professionals and administering a positive reinforcement program.

The WRPS disciplinary program**,** documented in TFC-BSM-HR_EP-C02-309, *Employee Discipline,* defines roles and responsibilities to ensure fair and consistent administration of discipline for WRPS employees. WRPS has a strong and fair disciplinary system which applies guidelines consistently and objectively. The disciplinary process is only used after thorough fact-finding investigations to determine the circumstances leading up to incidents. WRPS conducts fact-finding investigations to ensure fair application of disciplinary actions and keeps the primary focus on correcting the root issue, not applying reactive discipline. The Team did not observe any issues with the implementation of the WRPS disciplinary system during the assessment.

Conclusion

WRPS has developed processes and work procedures to identify and control hazards, and communicate those processes via training, engagement meetings, and company webpage postings. Managers and workers understand the hierarchy of controls applied to their various

work area hazards, with the first choice being elimination or engineered controls to reduce or mitigate work hazards. Managers and safety professionals ensure proper PPE access, and employees are confident in their ability to talk to certified safety professionals when needed. WRPS utilizes innovative methods, such as meteorological monitoring stations, reader boards, area sample location monitoring devices, to constantly monitor vapors at the tank farm and inform employees of waste transferring operations.

WRPS has implemented a new approach to bring awareness to driving hazards by utilizing roadside signs and vehicle wrapping to remind workers to drive safely at all times. Certified safety and health professionals are available to identify hazards and recommend controls. Managers and supervisors seek and respect the workers' opinions and ideas before finalizing work packages and implementing applicable controls. However, WRPS should review workplace inspection policies, procedures, training, and qualification requirements to ensure individuals conducting workplace inspections are familiar with common safety hazards and applicable abatement methods. WRPS provides workers with extensive occupational medicine support and emergency response capabilities. Although WRPS provides adequate preventive and predictive maintenance capabilities using the EAM software, it should consider utilizing the EAM mobile platform to add the capability of accessing and entering data in real-time during maintenance operations. Also, WRPS should review the safety program documents associated with the Hearing Conservation Program, Silica Program, and Hazard Communication Program to ensure that the programs clearly demonstrate and document compliance with their associated regulatory requirements. WRPS celebrates workers accomplishments and contributions to the company by using an adequate positive reinforcement program and controls disciplinary action system bias by focusing on the root cause of the problem instead of placing blame on employees. WRPS meets the Hazard Prevention and Control expectations for continued participation in DOE-VPP.

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 employees understand their responsibilities, recognize hazards they may encounter, and are capable of acting in accordance with management expectations and approved procedures.

Since the last DOE-VPP Assessment in 2017, WRPS has maintained and, in some instances, improved the training provided to all employees, supervisors, and managers. The following discussion describe the safety and health training program, changes and improvements which ensure everyone understands present operational hazards, procedures to identify and report on hazards, and programs or processes to mitigate potential hazards.

The WRPS training organization develops and provides training for maintenance, operations, and technical staff as required by DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities,* and the site's TFC-BSM-TQ_ADD-C-01**,** *Conduct of Training Administration*, and TFC-BSM-TQ-ADD-D-01.1, *Analyze, Design, Develop, Implement and Evaluate Implementation Guide*. The Analyze, Design, Develop, Implement and Evaluate Implementation Guide describes the process used by WRPS TOC organizations to decide if new training or changes to existing training is necessary. If applicable, it covers how to design, develop, implement, and evaluate the training courses effectiveness.

The WRPS training organization manager has two deputy training managers and a staff of 27 training specialists and 3 administrative assistants responsible for developing and providing required training. The training organization provides general and project-specific computer-based training, hands-on, and classroom training at either the 2752E facility, Terminal Drive (Richland Airport) facility, and on-the-job training or evaluation in the field. Supervisors, collaborating with the training organization, are responsible for ensuring all employees, supervisors, and managers complete required training, qualifications, and certifications to perform work safely.

A deputy training manager oversees a Technical group and an Operations and Maintenance group. The Technical group develops instructional materials and presents nuclear safety basis, engineering, IH, environmental, radiation control, conduct of operations, and human performance improvement training courses. The Operations and Maintenance group provides qualification training for nuclear chemical operators, radiation control technicians, IHT, and construction and craft employees.

HMIS facilitates WRPS employees with hands on and classroom training at the Hazardous Materials Management and Emergency Response training facility. The 88-acre, multifaceted training campus is comprised of classrooms, specialty instruction areas, and life-size mockup facilities for conducting workplace, emergency response, incident command, and hazardous material scenarios incorporating a variety of simulated industrial hazards. Instructors are comprised of professionals and worker trainers provided by each of the Hanford prime contractors. Additionally, HMIS provides WRPS employees hazardous waste operator, fall protection, ladder safety, lock-out/tag-out, confined space, and radiation control training.

WRPS hiring managers, employee supervisors, the IH organization, and training staff collaborate in the development of an employee's training plan in accordance with TFC-PLN-61, *Tank Operations Contractor Training and Qualification Plan.* TFC-PLN-61 describes the training program elements and training management systems utilized to achieve and maintain a trained and qualified workforce capable of safely performing assigned job duties. Training requirements are dependent upon the employees' position, potential exposures, job role, and task specialty sets.

In addition, managers, coordinating with the IH organization, develop an EJTA for each new employee or new job assignment. Supervisors use EJTAs to help develop the employees training requirements based on potential hazard exposures. The EJTA stipulates applicable occupational hazards monitoring programs, defines physical and medical examination requirements, any medical baseline testing, and the employee's training requirements based on expected work tasks and hazards. After the employee satisfies the physical requirements, they meet with a supervisor to discuss training requirements. Supervisors update EJTAs annually or revise them as needed when an employee's essential job functions, physical job requirements, or the needed medical qualifications change because of a job transfer, job description change, or in response to new hazards.

WRPS provides a variety of general non-technical training courses to improve communication, reinforce understanding of individual roles and responsibilities, and improve knowledge of safe work expectations, e.g., Crucial Conversations, Conduct of Operations, Introduction to Industrial Hygiene, Emergency Response, Human Performance Improvement Fundamentals, Safety Culture, and leadership and organizational culture courses specific to WRPS and TOC. In addition, the Training Organization provides the following courses:

- *Speak Up Listen Up* developed by Caterpillar® and brought to WRPS by Amentum, a partnering company, is a 2-hour course designed for all WRPS employees. *Speak Up Listen Up* helps employees recognize the normal fears and excuses that keep them from speaking up when observing unsafe behavior and provides tools to overcome those fears. *Speak Up Listen Up* also is designed to assist employees on how to receive constructive feedback in a respectful manner. WRPS requires both experience and new employees at the Hanford Site to complete the course to ensure familiarity with the latest safety culture trends.

- Supervisor Training and Accountability Recognition Training is a 3-hour communication course also brought to WRPS by Amentum, designed for managers and supervisors to assist in modeling productive behaviors and values in the workforce. Some of the techniques taught include communicating clear expectations, demonstrating commitment, encouraging active involvement, facilitating meaningful conversations, and coaching with regular conversations.

- WRPS initiated *Stepping Stones to Safety Excellence* after experiencing a downturn in employee participation in safety programs and councils remerging from the COVID-19 Pandemic. This training requires employees to attend a 4-hour classroom session between 90 to120 days after their hire date where employees can ask SMEs questions about their programs and how it contributes to WRPS mission and employee's overall wellbeing. The training also covers regulatory compliance, as well as company-based programs, while reinforcing the overall influence of DOE-VPP and safety culture.

- The Training Manager provides a 4-hour 10 CFR Part 851, *Worker Safety and Health Program* orientation training to all prime and subcontractor employees, as well as any other type of worker at the Hanford Site. The orientation covers worker rights and responsibilities and familiarizes them to the WRPS safety culture environment. All employees working at the Hanford Site, regardless of their contract, must complete the Hanford General Employee Training which covers everything they must know as it pertains to any facility at the Hanford Site. In addition, WRPS employees must also complete TOC Hanford General Employee Training which pertains specifically to the WRPS contract facilities, operations, and field work.

- WRPS requires field work supervisors, persons in charge, operation engineers, shift managers, operations managers, and first line supervisors to complete Leadership for Front Line Management, comprised of four courses, within 2 years of assignment. Supervisory courses include Crucial Conversation/Communication, Crucial Influence, TLP 150 *Safety Culture for Front Line Managers,* and Leadership in High Hazard Facility Operations. New field work supervisors and persons in charge must also complete 40 hours of advanced system and 40 hours of leadership concept of operations training. Twenty WRPS managers completed TLP 200, *Safety Culture for Senior Management*, and 16 executive and senior managers completed the Leadership in High Hazard Operations training.

- The Human Resources office conducts new hire orientation training. HAMTC safety representatives and WRPS safety professionals conduct the safety portion, familiarizing new hires with HAMTC union safety representative responsibilities, Master Safety Rules, Worker's Bill of Rights, key employee safety responsibilities, emergency procedures, ISMS and VPP – Shaping an Effective Safety Culture, Accident Prevention Councils, safety and health programs, radiological controls program, and IH. Safety representatives and employee supervisors provide more detailed training on procedures and work practices specific to their position and assigned tasks.

Safety Basis Training (SBT) qualifications per TFC-BSM-TQ-STD-24, REV B-2**,** *Safety Basis Training Program Description,* and 10 CFR 835, *Occupational Radiation Protection,* must be completed before a worker is assigned to production work in the Tank Farm. WRPS designed the SBT program to keep designated facility personnel knowledgeable on the Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSR) for each facility where a DSA is applicable. SBT covers the DSA for facilities where directly implemented and is needed at a minimum, for positions identified in TFC-BSM-TQ-STD-23, *TOC Training Implementation Matrix (TIM)*. The SBT program also includes training for the Unreviewed Safety Question (USQ) process which engineering managers, project managers, shift managers, and USQ evaluators must attend. To ensure document alignment, evaluators implement the USQ process. Additionally, facility trainings may include concepts from the DSA and TSRs when prudent and applicable to the subject matter at hand.

Supervisors, managers, and training organization staff track and monitor qualifications and EJTA status, and schedule training in the Learning Management System located on the WRPS intranet Webpage and the Hanford Site Worker Eligibility Tool. The tool produces color coded watch stander reports (red/yellow/green) identifying the training or qualification status of an employee. The reports provide course completion, competent persons certification, professional skill

qualifications and requalification dates. An “at-a-glance” report view indicates who is current, coming due, and past due, enabling supervisors to quickly determine if an employee is allowed to perform a job task. Supervisors and managers verify a worker’s qualification by visiting the website and annotating work control documents accordingly.

Training staff monitor instructor-led training courses to ensure an effective learning experience has been achieved through formative (during the training course) and summative (after the training course). Students complete Level 1 (student reaction to training) and Level 2 (student learning during and after training) course evaluation forms. Evaluators analyze responses to identify issues and training staff and facilitators consult with the Training Manager to review the evaluations and determine applicable corrective actions. Level 3 course evaluations (student behavior change) assess workers on their job performance after receiving training and verifies that desired changes in behavior have occurred in the job environment.

The Procedures organization supports the training organization in development and revision of training courses using the workflow review and approval process. A project organization, or owner, works with the Training and Procedures organizations to determine, and develop the required training to meet the owners need. Procedure owners submit a work procedure request similarly to work requests orders, which are then submitted and developed in work planning and control, via the workflow review and approval process, detailing formal training requirements and type of training to be developed.

The training organization performs periodic systematic evaluations of training and qualification programs per DOE-STD-1070-94, *Criteria for Evaluation of Nuclear Facility Training Programs*. WRPS conducts assessments of the WRPS TOC and vendor-provided training programs to ensure compliance with requirements and provide reasonable assurance of a trained and qualified work force.

Conclusion

WRPS is providing training to all employees, supervisors, and managers to ensure awareness of the type of hazards they may be exposed to, the procedures to identify and report on hazards, and the programs or processes to mitigate the potential hazards. An appropriately staffed Training organization develops and provides training for operations and technical staff as required by governing documents. WRPS provides general and project specific computer-based training, hands-on, and classroom site-specific training at either the 2752E facility, Terminal Drive (Richland Airport) facility, and during on-the-job training or evaluation in the field.

Hanford Mission Integration Solutions, LLC provides specialized hands-on and mockup training at the Hazardous Materials Management and Emergency Response training facility. In addition to TOC technical specific training, WRPS provides numerous all hand and position general and supervisory training. Supervisors and managers ensure employees complete SBT before performing any production work. Supervisors and managers develop EJTAs for all employees. Training staff consult with the Training Manager to evaluate courses. Procedures are in place to evaluate training and ensure new or revised training is developed collaborating with the Procedures organization. WRPS meets the expectations for Safety and Health Training and continued participation in DOE-VPP.

VIII. CONCLUSIONS

WRPS continues to pursue safer operations for employees by leveraging mechanisms such as the EAM software to conduct maintenance activities at designated facilities and actively informing employees of waste disturbing activities via reader boards placed on the side of the road. WRPS leaders recognize their key role in preparing the workforce for the future WTP support mission, and they rely on a strong safety culture among the workforce and the application of ISM to continuously improve. WRPS leaders assess safety culture using various surveys and reviews, and workers have a voice to identify concerns through multiple avenues. WRPS employees receive adequate support from SMEs and are provided with opportunities to participate in safety committees designed to keep safety expectations at the forefront. WRPS provides general and project specific training and managers ensure employees complete SBT before performing any production work. WRPS staff recognize that collaboration among different site contractors and its own internal organizations is critical to ensure the safety of the workforce. WRPS thoroughly analyzes hazards by performing JHA and has created a continuous improvement culture that learns from mistakes and those of other DOE contractors. Interviewed workers consistently responded positively about their WRPS work experience, their empowerment to work safely, and contributions to a safe work environment.

The Team identified some opportunities for improvement that will help WRPS continue towards excellence in safety and health. The Team did not identify any programmatic noncompliance with DOE safety requirements that would preclude participation in DOE-VPP. WRPS continues to meet all the expectations for DOE-VPP, and the Team recommends WRPS continue to participate in DOE-VPP at the Star level.

APPENDIX: EHSS Leadership and DOE-VPP Assessment Team

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