Bechtel BWXT Idaho, LLC Advanced Mixed Waste Treatment Project

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
April 20-May 1, 2009

U.S. Department of Energy
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Foreword

The Department of Energy (DOE) recognizes that true excellence can be encouraged and guided but not standardized. For this reason, on January 26, 1994, the Department initiated the DOE Voluntary Protection Program (VPP) to encourage and recognize excellence in occupational safety and health protection. This program closely parallels the Occupational Safety and Health Administration (OSHA) VPP. Since its creation by OSHA in 1982 and DOE in 1994, VPP has demonstrated that cooperative action among Government, industry, and labor can achieve excellence in worker safety and health. The Office of Health, Safety and Security (HSS) assumed responsibility for DOE-VPP in October 2006. Assessments are now more performance based and are enhancing the viability of the program. Furthermore, HSS is expanding complex-wide contractor participation and coordinating DOE-VPP efforts with other Department functions and initiatives, such as Enforcement, Oversight, and the Integrated Safety Management System.

DOE-VPP outlines areas where DOE contractors and subcontractors can surpass compliance with DOE orders and OSHA standards. The program encourages a "stretch for excellence" through systematic approaches, which emphasize creative solutions through cooperative efforts by managers, associates, and DOE.

Requirements for DOE-VPP participation are based on comprehensive management systems with associates actively involved in assessing, preventing, and controlling the potential health and safety hazards at their sites. DOE-VPP is designed to apply to all contractors in the DOE complex and encompasses production facilities, research and development operations, and various subcontractors and support organizations.

DOE contractors are not required to apply for participation in DOE-VPP. In keeping with OSHA and DOE-VPP philosophy, *participation is strictly voluntary*. Additionally, any participant may withdraw from the program at any time. DOE-VPP consists of three programs with names and functions similar to those in OSHA's VPP: Star, Merit, and Demonstration. The Star program is the core of DOE-VPP. This program is aimed at truly outstanding protectors of employee safety and health. The Merit program is a steppingstone for contractors and subcontractors that have good safety and health programs, but need time and DOE guidance to achieve true Star status. The Demonstration program, expected to be used rarely, allows DOE to recognize achievements in unusual situations about which DOE needs to learn more before determining approval requirements for the Star program.

By approving an applicant for participation in DOE-VPP, DOE recognizes that the applicant exceeds the basic elements of ongoing, systematic protection of associates at the site. The symbols of this recognition provided by DOE are certificates of approval and the right to use flags showing the program in which the site is participating. The participant may also choose to use the DOE-VPP logo on letterhead or on award items for employee incentive programs. DOE will provide the opportunity for contractors to work cooperatively with the Agency to resolve health and safety problems. Each approved site will have a designated DOE staff person to handle information and assistance requests from DOE contractors.

This report summarizes the results from the evaluation of Bechtel BWXT Idaho, LLC (BBWI), at the Advanced Mixed Waste Treatment Project during the period of April 20-May 1, 2009, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding BBWI's participation in DOE-VPP as a Star site.

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ABBREVIATIONS AND ACRONYMS

AMLLW	Alpha Mixed Low Level Waste
AMOW	Approved Method of Work
AMWTP	Advanced Mixed Waste Treatment Project
BBWI	Bechtel BWXT Idaho, LLC
BLS	Bureau of Labor Statistics
C.F.R.	Code of Federal Regulations
DART	Days Away, Restricted or Transferred
DOE	Department of Energy
DSA	Documented Safety Analysis
ERO	Emergency Response Organization
EDF	Energy Drive Facility
ESIT	Employee Safety and Improvement Team
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High-Efficiency Particulate Air
HPI	Human Performance Improvement
HSS	Office of Health, Safety and Security
ID	Idaho Operations Office
IH	Industrial Hygiene
INL	Idaho National Laboratory
IS	Industrial Safety
ISMS	Integrated Safety Management System
ITP	Individual Training Plan
IUOE	International Union of Operating Engineers
KEYS	Keep Everyone and Yourself Safe
MLLW	Mixed Low Level Waste
MSDS	Material Safety Data Sheet
NAICS	North American Industry Classification System
NFPA	National Fire Protection Association
OJT	On-the-Job Training
OMP	Occupational Medicine Program
OSHA	Occupational Safety and Health Administration
PA	Public Address
PPE	Personal Protective Equipment
PTW	Permit to Work
RCRA	Resource Conservation and Recovery Act
RPTW	Request for Permit to Work
RWMC	Radioactive Waste Management Complex
SER	Safety Evaluation Report
SME	Subject Matter Expert
STS	Safety Trained Supervisor
Team	Office of Health, Safety and Security DOE-VPP Team
TRAIN	Training Records and Information Network
TRC	Total Recordable Case
TRU	Transuranic
TRUPACT-II	Transuranic Package Transporter Model 2
TSA	Transuranic Storage Area

TSA/RE	Transuranic Storage Area/Retrieval Enclosure
TSD	Treatment/Storage/Disposal
TSR	Technical Safety Requirements
VPP	Voluntary Protection Program
WIPP	Waste Isolation Pilot Plant

EXECUTIVE SUMMARY

Bechtel BWXT Idaho, LLC (BBWI), is the management and operating contractor for the Advanced Mixed Waste Treatment Project (AMWTP). Located within the Radioactive Waste Management Complex at the Idaho National Laboratory, the function of AMWTP is to retrieve a variety of wastes stored above ground on asphalt pads, characterize, sort, treat, and ship the wastes to their final disposal sites, primarily the Waste Isolation Pilot Plant in New Mexico.

BBWI submitted its application for participation in the Department of Energy (DOE) Voluntary Protection Program (VPP) after completing its Integrated Safety Management System Phase II verification. After review and acceptance of the application, the Office of Health, Safety and Security (HSS) performed an onsite review from April 20-May 1, 2009.

The onsite review addressed each of the five tenets of DOE-VPP. The HSS DOE-VPP Team (Team) determined that BBWI has a strong management team that has clearly demonstrated leadership and commitment to excellence in safety and health. Similarly, employee involvement is very strong with many programs focused on encouraging and improving additional employee participation in safety and health initiatives. The remaining three tenets, while functioning effectively to minimize or prevent worker injuries and illnesses, have some opportunities for both managers and workers to identify and implement improvements and demonstrate excellence beyond compliance. Many improvements have already been self-identified by BBWI, particularly in safety and health training, but could be better prioritized and planned to ensure they are effectively accomplished.

Based on the strength of management leadership and employee involvement and BBWI's demonstrated ability to identify and implement improvements, the Team is confident the remaining opportunities for improvement will be effectively implemented. Consequently, the Team is recommending that BBWI be admitted to DOE-VPP at the Star level.

TABLE 1

OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	**Page**
BBWI should reevaluate the hazards assessment process to ensure step-by-step analysis of hazards is clearly documented, including any assumptions made by the personnel conducting the assessment.	**12**
BBWI should consider installing a badge reader at the gate between AMWTP and RWMC and linking the gate opening sequence to the badge reader to ensure all personnel entering or leaving AMWTP are fully accounted for.	**15**
BBWI should review implementation of the Hazard Communication Program to ensure requirements for labeling and inventory of chemical hazards are clear and understood by the workforce.	**17**
BBWI should emphasize more frequent procedural reference by supervisors to ensure workers are aware of and following prescribed hazard controls.	**17**
BBWI should review the "lost" work requests that were postponed or given low priorities to ensure the work actions did not, or do not, represent a potential hazard to workers or the facilities.	**18**
BBWI should consider encouraging supervisors and managers to pursue certification as an STS.	**22**
BBWI should clearly prioritize the update and maintenance of instructional materials, course files, and qualification records, as well as other self-identified improvements of the training program.	**23**

I. INTRODUCTION

Bechtel BWXT Idaho, LLC (BBWI), project scope is to safely operate the Advanced Mixed Waste Treatment Project (AMWTP) at the Idaho National Laboratory (INL) and to ship up to 11,333 cubic meters (m^3) of transuranic (TRU) waste to the Waste Isolation Pilot Plant (WIPP) or a commercial treatment/storage/disposal (TSD) facility in the 17-month contract ending September 30, 2009. This will support the Department of Energy (DOE) objective to ship the entire 65,000 m^3 from the Idaho site by the end of 2015. BBWI also provides payload assembly and shipping support for shipment of an estimated 2,000 m^3 of Accelerated Retrieval Project waste from the Idaho site to WIPP. The project work scope includes retrieval of waste from storage, characterization, treatment as necessary, certification, preparation, and loading of shipments to WIPP. In addition to the TRU waste, the contractor uses cost savings identified through process improvements to treat and dispose of alpha-mixed low level waste (AMLLW) and mixed low level waste (MLLW). These are laboratory and processing wastes from Rocky Flats and various DOE facilities and laboratories. The wastes are currently stored in drums, boxes, and bins at the INL TRU Storage Area (TSA). The waste is believed to contain both Resource Conservation and Recovery Act (RCRA) hazardous waste constituents and radioactivity, hence classifying it as a "mixed waste." Some wastes may also contain Toxic Substances Control Act regulated materials, such as polychlorinated biphenyls and asbestos. Currently, the Idaho site has the majority of DOE's stored AMLLW and TRU waste.

AMWTP is located within the Radioactive Waste Management Complex (RWMC), which consists of two main areas: the 35.6-hectare (~88 acres) Subsurface Disposal Area and the 22.3-hectare (~55 acres) TSA. Two additional areas provide support: the Administrative Area and the Operations Area. AMWTP facilities are located in TSA, and AMWTP activities take place within this area. AMWTP operations are broadly split into 2 areas: retrieval and treatment. Retrieval covers the removal of waste from storage locations, characterization buildings WMF-634/-610/-628/-635, onsite and offsite transportation, and Transuranic Package Transporter Model 2 (TRUPACT-II) or Type B Container loading before shipping. Primarily, treatment covers the entirety of operations performed within the Advanced Mixed Waste Treatment Facility; WMF-676, including the sorting of box contents into drums, handling of special case waste, and size reduction. The scope of treatment extends beyond WMF-676, to include other waste treatment operations requiring contamination control that cannot be performed within WMF-676. This scope includes, for example, drum repacking in temporary confinement structures (soft-sided "tents" or hard-sided structures). These involve activities, such as handling, examining, or treatment of waste; for example, overpacking of drums, crushing empty drums, absorbing aqueous or organic liquids, decanting aqueous or organic liquids, relidding, examining visually, sorting, and reducing the size of plywood removed from storage arrays in the TSA/Retrieval Enclosure (TSA/RE). The scope of retrieval operations allows containers requiring no treatment to be removed from storage, certified, and shipped. Due to the type and quantity of materials present in the facility, AMWTP is categorized as a Category 2 Nuclear Facility.

The AMWTP was initially constructed and operated by British Nuclear Fuels Limited as a privatized contractor for DOE. The contract was converted to a management and operating contract with DOE assuming ownership of the facilities. BBWI assumed the contract in 2005. The contract is a cost reimbursement with performance-based incentives for volume of TRU waste shipped to WIPP and MLLW shipped to commercial and DOE TSD facilities. While BBWI is expected to safely operate AMWTP, there are no specific incentives for safety

management performance. The BBWI contract includes Department of Energy Acquisition Regulation clause 970.5223-1, "Integration of Environment, Safety, and Health into Work Planning and Execution." Included in the Contract "List B" are DOE Order 226.1, "Implementation of DOE Oversight Policy," and DOE Policy 450.4, "Safety Management System Policy." Accordingly, the DOE/Idaho Operations Office (ID) performed an Integrated Safety Management System (ISMS) Phase II Verification from February 5-23, 2007. DOE/ID withheld approval of BBWI's ISMS as a result of issues arising from the improper shipment of an uncertified waste drum to WIPP. DOE/ID conducted a final reverification review July 9-12, 2007, and approved BBWI's ISMS on October 11, 2007.

BBWI submitted its application for participation in DOE-VPP to DOE/ID in December 2008. DOE/ID endorsed the application and forwarded it to the DOE Office of Worker Safety and Health Assistance, within the Office of Health, Safety and Security (HSS), for review and approval. Per DOE-VPP requirements, initial certification requires an onsite review to be conducted by the HSS DOE-VPP Team (Team). This report provides the results of that onsite assessment conducted April 20-May 1, 2009.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (BBWI)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	DART* Cases	DART* Case Rate
2006	1,278,901	6	0.94	3	0.47
2007	1,410,942	9	1.28	4	0.57
2008	1,475,465	12	1.63	6	0.81
3-Year Total	4,165,307	27	1.30	13	0.62
Bureau of Labor Statistics (BLS-2007) average for NAICS** Code # 5622 Waste Treatment and Disposal			6.4		4.1
Injury Incidence/Lost Workdays Case Rate (BBWI Subcontractors and Vendors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2006	341,525	1	0.59	0	0.00
2007	251,505	0	0.00	0	0.00
2008	138,284	0	0.00	0	0.00
3-Year Total	731,314	1	0.27	0	0.00
Bureau of Labor Statistics (BLS-2007) average for NAICS** Code # 562 Waste Management and Remediation Services			6.4		4.1

* Days Away, Restricted or Transferred
** North American Industry Classification System

TRC Incidence Rate, including subcontractors: 1.14
DART Case Rate, including subcontractors: 0.53

The accident and injury statistics above indicate that TRC rates have been rising for the past 3 years. Reviews of records indicated the primary contributor to these statistics have been slips, trips, and falls. BBWI recognized this trend last year and took aggressive action to raise worker awareness and reverse this trend. To date, those actions have been effective, with no recordable or reportable injuries since December 2008. In addition, BBWI has not had a lost workday case in over 5 years. Even in 2008, with the highest annual average, the average TRC rate was only 26 percent of the comparison industry rate. The accident and injury rates clearly qualify for participation in DOE-VPP.

III. MANAGEMENT LEADERSHIP

Management leadership is a key element of obtaining and sustaining an effective safety culture. The contractor must demonstrate senior-level management commitment to occupational safety and health in general and to meeting the requirements of DOE-VPP. Management systems for comprehensive planning must address health and safety requirements and initiatives. As with any other management system, authority and responsibility for employee health and safety must be integrated with the management system of the organization and must involve employees at all levels of the organization. Elements of that management system must include (1) clearly communicated policies and goals; (2) clear definition and appropriate assignment of responsibility and authority; (3) adequate resources; and (4) accountability for both managers and workers. Finally, managers must be visible, accessible, and credible to employees.

BBWI managers have successfully fostered a safe work ethic across all operations. A recurring theme from all workers interviewed was that managers were frequently present at the site and participated in activities that promoted safe, compliant production. Since assuming the contract for operation of AMWTP in 2005, BBWI has built on workers' fundamental safety culture by successfully implementing DOE Regulations and Orders, such as Integrated Safety Management and Emergency Management, and finally, by committing to the pursuit of DOE-VPP Star status.

BBWI has established a clear policy that all injuries are preventable, and prevention of all injuries is a fundamental prerequisite for work. That policy was published, along with behavioral expectations for both managers and workers, and subsequently signed by the senior management team, the local bargaining unit representatives, and the co-chairs of the Employee Safety and Improvement Team (ESIT). Signed copies of this policy are posted throughout the site. All personnel interviewed clearly understood that policy. No personnel expressed any concerns about production over safety, but clearly recognized that safety was an expectation, and that production was a result of safety.

BBWI managers track safety performance through a number of performance indicators, primarily TRC and DART case rates , but also through First Aid cases and Occurrence Reporting and Processing System incidents. In addition, senior managers use concerns and issues from both external and internal reviews, inspections, and assessments to identify performance improvement opportunities. Several times a year, Management Assessment Reviews and Performance Improvement Plans are used to focus management actions based on expected value, including safety. For example, when BBWI was provided information related to an injury that occurred at WIPP in February 2009, the Plant Manager formed a team to perform a Management Assessment Review on the circumstances and to determine BBWI's risk of a similar accident. When applicable, BBWI uses the Six-Sigma approach to identify appropriate variables and corrective actions. These teams involve both senior managers and workers.

Goals for TRC and DART case rates are established by senior managers. These goals are not published and are not used to determine employee bonuses or variable pay. Workers did not exhibit any hesitance to report safety issues, accidents, or injuries. Each year, BBWI prepares a Safety Impact Plan. That plan includes an analysis of safety issues or problems encountered in the previous year, and the establishment of goals for the coming year. Metrics showing performance against this plan are regularly reviewed by the management team, and used to adjust policies, processes, and focus managers' attention during field assessments.

A strength noted in the BBWI managers was their willingness to identify and commit resources to safety and health improvements. For example, employees selected as chairpersons for the ESIT are put into those positions full time as their primary duty, rather than as a collateral duty. Managers have also identified and used a contract fee where necessary to supplement funding for safety and health promotional activities, recognition, and rewards. BBWI has sufficient staff assigned to safety and health to ensure adequate workplace monitoring during hazardous activities, including both Industrial Hygiene and Radiological Controls. BBWI has established some practices, discussed in the Hazard Prevention and Control section, that go beyond basic compliance, such as real time monitoring of physiological data for heat stress, that represent additional investment and promote excellence in safety and health. None of the personnel interviewed expressed any concerns over availability of expertise or equipment for safety and health. Worthy of particular note is that as a result of this investment in safety and health improvements and worker recognition, BBWI has significantly improved the operating tempo of the plant. BBWI is meeting or exceeding its production goals while simultaneously reducing and preventing injuries and accidents. BBWI managers all recognize the value of safety and health improvements not as just a cost avoidance, but as a means of ensuring the workforce is working effectively on a day-to-day basis.

All personnel interviewed were aware of their personal accountability for safety and health. Managers clearly demonstrated open and honest discussions with workers for both safe and unsafe behaviors. During site observations, managers frequently discussed with workers conditions observed that were not up to site expectations. Managers make use of safety certificates for positive feedback to workers. Managers also participated in the Plant Operations Walkdown for Excellence and Reliability walks. These walks are lead by the Plant Manager, who not only picks the focus area for the walk, but then actively participates. These walks provide all participants with an excellent opportunity to observe and subsequently reward safe behaviors, as well as discuss potentially unsafe behaviors in a nonthreatening way. Senior managers also provide a 30-minute introduction to new employees during initial training sessions. Additional visits occur several times throughout the first few weeks of training. The discussion reinforces managers' philosophies and priorities, emphasizing such elements as "safely, compliantly, and efficiently," Keeping Everyone and Yourself Safe (KEYS), current injury goals and accomplishments, Human Performance Improvement (HPI), value cards, and fitness for duty.

Safety is also included as an essential element in annual reviews. Last year, BBWI began establishing individual safety plans. Each employee develops their own personal safety plan based on their job scope and manager's expectations. Performance against that plan is then considered during the employee's annual review. Similarly, managers were also responsible to develop their own personal safety plans.

BBWI has very few subcontractors working at the site. In general, subcontractors are either staff augmentees that are treated exactly like BBWI employees or vendors that are onsite for short periods of time. In all cases, subcontractors receive the same site access training as BBWI workers if they are to be unescorted. Subcontracts include provisions that subcontractor employees will follow the BBWI safety and health program while onsite.

Conclusion

BBWI has a strong management team that is personally committed to accomplishing the AMWTP mission safely, compliantly, and efficiently. Improvements in safety and health have been used to drive other improvements across the plant; establish a strong, caring safety culture; and build a sense of team and community throughout the workforce. Appropriate goals are established and resources are appropriately prioritized and applied to meet those goals. Senior managers' visibility in the workspaces and familiarity with both workers and their jobs were excellent and clearly modeled expectations for middle managers and supervisors.

IV. EMPLOYEE INVOLVEMENT

Employees at all levels must continue to be involved in the structure and operation of the safety and health program and in decisions that affect employee health and safety. Employee participation is in addition to the individual right to notify appropriate managers of hazardous conditions and practices. Field observations and interviews indicate that BBWI employees generally remain committed to their personal safety, as well as the safety of their coworkers and facility visitors.

BBWI employees are actively engaged in the safety and health program. The Team's review of program documents and the information collected from interviews with employees indicated that management has fully empowered employees to participate in the safety and health programs. It was evident during interviews that employees are motivated about the company's position on building a safe work environment. Workers are encouraged to participate in safety inspections; attend the annual INL Safety, Engineering, and Science Exposition; and serve on a safety and health committee or subcommittee. Employees are familiar with the tenets of DOE-VPP and have a sense of ownership of their safety, as well as that of their coworkers.

Employee ownership is manifested through involvement in a variety of safety-related programs that encourage individual and group participation. Examples include the ESIT, plan-of-the-day meetings, prejob meetings, hazard assessments development sessions, site walkdowns, corrective action management, submission of issue forms, and regular safety meetings.

ESIT is BBWI's primary committee for safety and health. The ESIT has two co-chairs elected by the employees (one is elected by the local International Union of Operating Engineers (IUOE) membership and the other, by all employees). While both of the current co-chairs belong to the IUOE, only one position is required to be filled by a union member. Additionally, there are seven Unit ESITs representing the workers at the Energy Drive Facility (EDF), A-Crew, B-Crew, C-Crew, D-Crew, 4x10 Non-facility and 4x10 Facility. Each Unit ESIT has its own chair, consisting of an employee and a senior manager "Champion." Each Unit ESIT and subcommittee conducts its own regular meetings, participates in ESIT, and reports its progress to ESIT. ESIT also has 10 subcommittees: (1) VPP Core Team; (2) Electrical Safety Subcommittee; (3) As Low As Reasonably Achievable Subcommittee; (4) Health Subcommittee; (5) KEYS Committee; (6) Communications Subcommittee; (7) Conduct of Operations Subcommittee; (8) HPI Subcommittee; (9) Environmental Health Promotions Subcommittee; and (10) Rolling Stock Committee. Each subcommittee also has its own employee chair and a senior manager champion.

ESIT, the Unit ESITs, and the subcommittees provide a critical avenue for employees to raise concerns which get immediate management attention. ESIT is employee-driven and supports safe, compliant production in accordance with the Project Management Plan, Project Execution Plan, and ISMS. ESIT was started before the employees voted to be represented by IUOE. The ESIT charter was endorsed by IUOE on April 8, 2009. The Team attended the ESIT and EDF Unit ESIT meetings, which were conducted professionally with top executives attending both meetings. There was strong employee participation in all of the meetings. About one third of the workforce belonged to ESIT or one of the Unit ESITs and participated regularly in ESIT meetings.

The Rolling Stock Subcommittee has been a particularly successful demonstration of employees and managers working together to improve safety. That subcommittee is responsible for review of all vehicle operations, including trucks, forklifts, carts, and trailers. It has made several recommendations to replace equipment and modify procedures to improve operational efficiency and safety. For example, the subcommittee made recommendations to improve the docking of drum transfer trailers to the Waste Treatment Facility, replace forklifts with tines that cannot be easily repositioned, and improve drum handling equipment. The managers supported implementing the subcommittee's recommendation. As a result of subcommittee recommendations and worker awareness, BBWI drum handing has significantly improved. As of this assessment, no drum had been dropped for 615 days, which is significant since BBWI handles almost 1,000 waste containers each day. Over 573,795 waste container moves have now been made since the last dropped drum incident.

The Communications Subcommittee uses Project Notes and Flash Bulletins to communicate to the workforce about upcoming safety events, lessons learned, etc. Additionally, ESIT has brochures with information about its subcommittees. There are also Safety Information Centers in three locations throughout the plant that all have brochures, lessons learned, ESIT minutes, and KEYS observation feedback, as well as other safety information. BBWI publishes a bimonthly safety promotional newsletter called "The End of the Roll" that is found in rest rooms throughout the facility.

Employees understood their individual right to notify appropriate managers of hazardous workplace conditions and practices. All employees contacted by the Team expressed their comfort in raising and elevating safety concerns and often noted how communicating concerns to management has been greatly improved under the current BBWI management team. Several employees felt that improved communications and the President and General Managers' open-door policy have made positive strides in achieving a fully implemented safety culture.

During the site review, employees were candid and exhibited a willingness to speak freely with Team members. Employees indicated that they understood their rights and responsibilities in accordance with title10, Code of Federal Regulations (C.F.R.), part 851 and were knowledgeable about their safety and health responsibilities. Workers strongly expressed their readiness to stop work if they felt conditions were unsafe. They also indicated they would intervene if they observed a potential hazard that would affect their coworkers. For example, one worker described an instance where he did a "step back" on a Saturday because his work document did not match the Lockout/Tagout log. Because the supervisor did not agree with the worker's assessment, the worker raised the question up the management chain of command. The Lockout/Tagout subject matter expert (SME) was contacted for resolution. The SME agreed with the worker's position. The Lockout/Tagout for the job was reanalyzed and corrections were made. The willingness of the worker to raise the issue to the appropriate personnel, without concern for retribution from his supervisor, is testament to the overall safety culture.

BBWI has several employee recognition programs to encourage safety. Examples include the Safety Certificate program and the Forklift Rodeo. Safety certificates are awarded by ESIT committee members, supervisors, managers, or other designated personnel to employees who have performed a noteworthy safe act. These certificates can then be used to enter frequent drawings for safety promotional items. The Forklift Rodeo is an annual safety awareness event at the plant. A course is set up for employees and managers to compete in safe driving and

operating forklifts. This event highlights the challenges associated with safe operation and is well attended by both employees and managers.

The Team found that BBWI managers acknowledge the importance of recognizing employees for participating in company safety awareness activities. BBWI recognizes employee contributions and successes are linked to continuous improvement in safety performance. BBWI's recognition program is not limited solely to BBWI employees, but also includes subcontractors and staff augmentation.

Conclusion

Employee ownership is strongly rooted across the BBWI organization. Managers and employees have worked together to develop open lines of communication to identify and promote safety and health responsibilities, goals and expectations, and to eliminate potentially hazardous conditions. BBWI meets the requirements of the Employee Involvement tenet.

V. WORKSITE ANALYSIS

Management of health and safety programs must begin with a thorough understanding of all hazards that might be encountered during the course of work and the ability to recognize and correct new hazards. There must be a systematic approach to identifying and analyzing all hazards encountered during the course of work, and the results of the analysis must be used in subsequent work planning efforts. Effective safety programs also integrate feedback from workers regarding additional hazards that are encountered and include a system to ensure that new or newly recognized hazards are properly addressed. Successful worksite analysis also involves implementing preventive and/or mitigative measures during work planning to anticipate and minimize the impact of such hazards.

BBWI has implemented ISMS and completed the DOE verification/validation. The AMWTP Authorization Agreement is in place and references those documents that form the foundation for safe operation of AMWTP. An Authorization Agreement is required under ISMS and has been signed by both the Manager of DOE/ID and the Manager of the site. Authorization Basis documents include the Documented Safety Analysis (DSA), the Technical Safety Requirements (TSR), the DOE Safety Evaluation Report (SER), and the Idaho Hazardous Waste Permit. BBWI has a DOE-approved DSA and associated TSRs for receipt, retrieval, treatment, storage, and shipment of TRU waste operations at the site. This DSA categorizes AMWTP as a Category 2 Nuclear Facility and describes, analyzes, and documents the hazards and consequences of upset conditions or accidents for the facility. The DOE-approved TSRs document those high level controls DOE depends upon for safe operation of the facility. The DOE SER documents the approval by DOE of DSA and TSRs. BBWI recently completed an update of DSA and incorporated the guidelines of DOE-STD-5506-2007, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities*, into the development of accident sequences. During the VPP assessment, the Team reviewed DSA and associated analysis to track implementation of DSA and TSRs into operating procedures. During the review of documents, the Team noted one potentially incomplete discussion relating to an accident postulated in DSA. The issue relates to a family of accidents involving propane tanks and the frequency and consequences of those accidents. Specifically, the Team was not sure that scenarios involving vehicle accidents involving two new propane tanks installed next to the TSA/RE had been adequately analyzed as part of the unreviewed safety question determination process. The issue was discussed with the appropriate managers and then turned over to DOE/ID for resolution.

Commitments from the Authorization Agreement and DSA are institutionalized through programs and policies to the task level. At AMWTP, task level documentation consists of operating procedures and work authorizations. BBWI authorizes work via a rigorous and complex work release process that provides overarching consistent procedures applicable to operations, retrieval, maintenance, and shipping. In that process, all work is categorized based on the expected scope and complexity of work. Two classes of exemptions, administrative and operational, are identified such that routine administrative work and routine simple operations within the workers skill (such as vehicle movements) do not require permits.

An Approved Method of Work (AMOW) is a permit prepared to control work activities when it is known that conditions are predictable and will remain constant over a long period of time. There are three types of AMOWs. First, is the General Access AMOW that addresses the hazards and controls for general access to AMWTP facilities. No work may be performed under

this type of AMOW. The second type is a Routine AMOW that addresses the hazards and controls that may be encountered during performance of frequent, routine work activities. Finally, a Task-Specific AMOW addresses the hazards and controls that may be encountered during the performance of infrequent, but routine work activities.

For nonroutine work, BBWI uses either a Permit to Work (PTW) or a Request for Permit to Work (RPTW). The PTW is a specific work permit prepared to identify and control hazards that are not routine or predictable, and are not minor in nature (do not fit as an AMOW or RPTW). A PTW provides the highest level of work control and is required if the work will affect a structure, system, or component that performs a Safety Significant (Class-I) function task; requires work on energized electrical circuit operating at 50 volts or more; requires a safety permit (other than lockout/tagout); generates a new hazardous, mixed, or radiological waste stream; requires the use of a hazardous chemical; requires respiratory protection; requires post-maintenance test (beyond a functional verification); requires any radiological Personal Protective Equipment (PPE); or has the potential to change the existing radiological conditions. If a PTW is not required and there is not an existing AMOW or exemption to perform the work, an RPTW may be used. In general, RPTW is limited to performing minor, infrequent, and nonroutine work activities not requiring a PTW.

Included in the work control/release documents above, hazards are identified to inform the workforce and prevent injury. BBWI uses its Industrial Hygiene (IH)/Industrial Safety (IS) Program to identify and analyze nonradiological hazards for worker protection. The Team's review of records and sampling data demonstrated that IH professionals have an adequate hazard baseline document in place and are managing the periodic sampling, monitoring, tracking, and trending of hazards. In addition to baseline documents, BBWI has a documented hazard assessment program that identifies existing and potential workplace hazards. The process directs a team of SMEs to perform the evaluation using a standard form to document the evaluation. The BBWI process includes hazard assessment worksheets, record sheets, exposure determination worksheets, and industrial hygiene exposure assessments. The hazard assessment process uses a pick list of hazards along with a field/job walkdown. The process includes the identification of chemical, physical, biological, and general safety hazards. Hazards and mitigations identified by this process are used to create work control documents discussed above.

In addition to the formal workplace hazard assessment process defined by the Hazard Assessment Instruction describe above, BBWI has an effective, documented workplace exposure assessment program that anticipates, evaluates, and assesses worker exposure to chemical, physical, and biological hazards through appropriate workplace monitoring. The Team reviewed the instruction, observed its use in the field, and reviewed the documentation produced as a result of workplace hazard monitoring. Baseline Hazards Assessments reviewed by the Team were complete and data was easily retrieved. The hazards for exposure to beryllium, lead, and asbestos are adequately addressed. The information on sampling and results from the identified hazards are forwarded to the Occupational Medical Program to track and trend worker exposures within particular exposure programs such as lead, beryllium, asbestos, and cadmium monitoring. Annually, the IH/IS Program publishes an Exposure Assessment Report performed by an outside consultant that evaluates the effectiveness of the IH/IS Program focusing on 10 C.F.R. 851, *Worker Safety and Health Program*, the American Industrial Hygiene Association's Strategy for Occupational Exposure Assessment, the National Institute for Occupational Safety and Health Occupational Exposure Sampling Strategy Manual, and 10 C.F.R. 850, *Chronic Beryllium Disease Prevention Program.*

In several cases, BBWI has used analyses to recognize trends and the need for more effective controls. For example, BBWI recognized that slips, trips, and falls were the most significant contributor to recordable and reportable injuries. BBWI implemented several new controls to address the issue, such as the use of a facility shuttle, increased employee awareness, and the use of shoe cleats. Regular workplace inspections were also effective in identification and correction of workplace hazards.

Reviews of the hazard analysis activities found that while the efforts to identify potential hazards and their mitigation are strong, the analysis performed by personnel identifying the hazards and justifying the mitigation is not well captured. For example, an AMOW for vehicle and equipment maintenance identified a hazard as "Eye/Face Injury." There was no documented analysis as to whether the risk was a mechanical injury to the eye or face, a result of chemicals used during the maintenance activity, or both. Many of the work areas at AMWTP are not posted as mandatory safety glass areas, leaving the worker to determine when to don PPE prescribed depending on the type of work or activity being performed. In some cases, the mitigation column of the hazard assessment directed that the worker use Material Safety Data Sheets (MSDS) to determine appropriate PPE. Delegating this decision to the worker to interpret MSDS-recommended controls creates a situation where workers may be making choices without sufficient guidance from safety and health professionals that are better qualified to interpret recommendations from MSDS.

Another example that demonstrates this concern is work performed in the welding and mechanical shops. BBWI has not adequately analyzed the potential eye hazards, and as a result, has not posted the shops as mandatory eye protection areas. A worker performing welding, cutting, grinding, or steel-fitting operations is expected to remember and then decide to don safety glasses. Other workers in proximity to, but not performing the work, may also be at risk. For instance, when one employee in a nonposted work area is near, or approaches a worker performing work requiring eye protection, the unprotected worker may be surprised when confronted with unexpected eye hazards. Dependence on workers to recognize the need for PPE, have the appropriate PPE with them, and then decide to wear it, decreases the likelihood that PPE will be worn when needed.

Many of the hazard assessment documents have not been reviewed and updated in several years. BBWI recognized that problem recently and revised the Hazard Assessment procedure to include a periodic review (3 years). Consequently, there is currently an extensive backlog of hazard assessments requiring review. BBWI should use this review as an opportunity to better document the analytical basis in the hazard assessment process.

Opportunity for Improvement: BBWI should reevaluate the hazards assessment process to ensure step-by-step analysis of hazards is clearly documented, including any assumptions made by the personnel conducting the assessment.

Interviews and observations of field activities demonstrated that safety and health professionals have a broad knowledge of their fields of expertise, were provided with adequate resources, such as direct reading meters and sampling equipment, and used nationally recognized sampling protocols.

BBWI has a process (INST-COPS-9.6.1, *Fact Finding Procedure*) that evaluates upsets and identifies abnormal conditions, investigates those conditions to determine root causes, and applies corrective actions. The BBWI accident/incident investigation system includes written guidance, written reports of findings and hazard correction tracking, identification of causes, and provisions for preventive or corrective actions. The system also provides for a narrative report suitable for dissemination to all employees containing root causes, analysis, and lessons learned.

A comprehensive trend analysis system for issues relating to the health and safety program (including injury and illness experience, inspections, and employee reports of hazards) is in place at AMWTP. A review of documentation and employee interviews confirms that this process is effective. The IH division maintains a database of all sampling and monitoring data. They can track and trend data, provide planning information, and provide input to the safety analysis organization for standard industrial hazards encountered in the performance of work. Additionally, IH personnel conduct tracking and trending regarding issues identified in periodic safety inspections to support the hazard baseline.

Conclusion

BBWI has mechanisms that analyze the range of hazards associated with the operation of the facility. The system for tracking and trending industrial hygiene data was noted as a particular strength. Mechanisms for workers to perform activity level hazard analysis needs significant improvement to ensure all hazards are adequately analyzed, and that specific controls are provided and justified by the analysis. Expectations should be clearly communicated and evaluated periodically to ensure continuous improvement.

VI. HAZARD PREVENTION AND CONTROL

Once hazards have been identified and analyzed, they must be eliminated (by substitution or changing work methods) or addressed by the implementation of effective controls (engineered controls, administrative controls, or PPE). Equipment maintenance processes to ensure compliance with requirements and emergency preparedness must also be implemented where necessary. Safety rules and work procedures must be developed, communicated, and understood by supervisors and employees. These rules/procedures must also be followed by everyone in the workplace to prevent mishaps or control their frequency/severity.

Substitution and engineered controls are the preferred method used by BBWI, followed by work practice controls. When those controls are not sufficient, PPE may be used. PPE is only used as the final protection level that engineered controls, substitution, and administrative controls could not mitigate, or when otherwise required by regulations.

BBWI provides engineered barriers in the form of primary and secondary containment of hazardous and radioactive material to protect workers, the public, and the environment from exposure. During handling and storage, waste containers and container liners provide primary containment. During procedures that involve intrusive characterization of the waste containers and treatment of the waste, chambers and gloveboxes provide the primary and secondary containment.

The ventilation systems in the characterization facilities provide another engineered barrier. The systems consist of a general exhaust for the building plus special-purpose exhaust systems in the drum venting system(s) and drum core sampling area. The drum venting system includes a vapor extraction system to evacuate headspace gases of drums, and a multistage high-efficiency particulate air (HEPA) filtered exhaust system. This exhaust system maintains a negative pressure in the drum venting system relative to the surrounding area and discharges through HEPA filters to the main facility exhaust. Other engineered controls include real-time radiography, gloveboxes, remote-controlled manipulators, radio assay, and specialized equipment for waste container movement. These are just a few examples that demonstrate how the facility/project reduces human contact with hazardous material via systems engineering approaches.

The Team reviewed administrative controls captured in the Fire Hazard Analysis and Fire Safety Assessments of Nonfacility Operations for combustible loading and control of fire hazards. In the TSA/RE numerous administrative controls are in place to minimize combustible loading, ensure waste is stored in a safe and compliant configuration, and allow for safe and compliant retrieval. Controls include waste stack height, fire retardant pallets and spacers, removal of excess materials, and regular inspections. There were no discrepancies observed during the Team's visit.

During the Team's work observations, most workers were observed wearing the prescribed and appropriate PPE. Electricians were observed faithfully using PPE prescribed by National Fire Protection Association (NFPA) 70E for arc flash protection. Workers observed during hot cell entries effectively donned and doffed PPE prescribed per work control instruction for entry into high contamination areas. Maintenance workers were observed using prescribed gloves and eye protection in the performance of their tasks. On several occasions during the Team's visit when winds exceeded 25 miles per hour, BBWI required personnel to wear eye protection while

outside the buildings. The Team did note some discrepancies related to the requirement for safety shoes or substantial footwear. MP-ISIH-2.2, Rev. 7 did not specify whether the approved or substantial footwear protection was required to the top of the foot or above the ankle. Footwear type and height varied greatly between workers due to the lack of clarity in the procedure.

Access to and from the site is controlled at the front gate. All personnel entering the site must either have site access training or be escorted at all times. BBWI has established a practice whereby visitors and newly assigned personnel wear green, high visibility vests for 6 months, rather than the orange vests. This raises the awareness of all site personnel to the presence of less experienced personnel, and gives site workers the opportunity to help visitors and new personnel remain safe. Accountability at the site is in general maintained through an electronic badge reader system. However, one potential area for improvement in site access procedures exists at the "back" gate between AMWTP and the RWMC (controlled by CH2M-Washington Group Idaho). That gate does not have a badge reader and is frequently open.

Opportunity for Improvement: BBWI should consider installing a badge reader at the gate between AMWTP and RWMC and linking the gate opening sequence to the badge reader to ensure all personnel entering or leaving AMWTP are fully accounted for.

Some weaknesses were identified in the AMOWs as briefed by supervisors regarding the level of detail and analysis pertaining to the hazard controls contained in management procedures. These issues were discussed in the Worksite Analysis Section.

The BBWI Occupational Medicine Program (OMP) is staffed by one licensed physician and one nurse. BBWI has contracted the Site Occupational Medical Director. Employees receive the appropriate medical evaluations depending on their status as new-hire employees, employees with certifications and surveillances, employees who are transferring to another position, and employees terminating from BBWI. An employee's responsible supervisor or manager completes and submits Form-1023, Job Function Evaluation, to OMP prior to initial preplacement examination and mandatory physical examinations, and with changes in employee job category/functions.

IH/IS provides pertinent sampling information/job tasks for individuals in surveillance or certification programs to OMP prior to physical examinations. This information is provided electronically to the occupational medical group so that an individual's medical history can be updated to reflect actual exposures sampled. For example, during a hot cell entry, BBWI performed real time remote monitoring to record heart rate, core temperature, and ambient temperature for heat stress. Based on predetermined action levels established by IH for each individual, the monitors alarm if any workers' levels register at the preset action level. IH/IS monitors employees during entry for indications of increased heart rates and body core temperatures and applies the American Conference of Governmental Industrial Hygienists recommendations for rest and access. Monitoring data is recorded and provided to the occupational medical group.

In the event of an injury, the occupational nurse is available to perform triage or stabilize/treat medical conditions. In the absence of the certified nurse, trained first aid responders may provide first aid treatment for minor injuries within the scope of their medical first aid training.

OMP monitors the care of employees who sustain occupational injuries/illnesses to ensure rapid reintegration into the workplace as soon as safely feasible. Should an employee require additional treatment, the nurse coordinates all visits to the contract medical doctor and the specialists recommended by the contract doctor.

The Emergency Plan/RCRA Contingency Plan, management procedures, and personnel training address the appropriate emergency responses for BBWI personnel. This plan provides the overall process to respond to and mitigate the consequences of operational emergencies, as well as events that require activation of the Contingency Plan for RCRA-permitted facilities. This plan supplements the INL Emergency Plan/RCRA Contingency Plan, known as the INL Base Plan, to ensure integration, coordination of notification and response activities with all INL contractors and with DOE/ID.

Drills are an integral part of the Emergency Management Program. Drills and exercises are conducted regularly with varying scenarios executed. Emergency Response Organization (ERO) members are on a duty rotation. BBWI participates in the INL Annual Exercise to the extent possible to exercise emergency capabilities and demonstrates its ability to coordinate with the INL Emergency Base Plan. The last drill involving the BBWI ERO was a qualification drill for one Emergency Action Manager. That drill was conducted on November 4, 2008, and was a simulated Drum Vent Deflagration and Fire in WMF-634. A position-specific drill for a Public Information Officer and BBWI Liaison Officer was conducted on March 19, 2009. There was an attempt to run the annual criticality drill on April 13, but that drill was cancelled by the Emergency Coordinator due to high wind concerns and an unrelated emergent issue that could not be readily resolved by the scheduled drill start time. Personnel interviewed were familiar with emergency response actions and evacuation routes.

During the course of the assessment, the Team recognized there were several areas that were not sufficiently covered by the facility-wide public address (PA) system. In those cases, BBWI personnel relied on radio communication. The PA system is an essential means of communicating emergency information to personnel that do not have facility radios. BBWI should evaluate weaknesses in the facility notification system and either correct them to ensure appropriate coverage for all personnel, or post areas where PA system coverage is inadequate and ensure radio communications are available when those areas are occupied.

The BBWI Hazard Communication Program is described in MP-ISIH-2.5, Rev. 5, *Hazard Communication Program*. It establishes the written Hazard Communication Program for BBWI as required by 29 C.F.R. 1910.1200. BBWI uses a variety of hazardous chemicals that are regulated under this program. An electronic MSDS system has been developed where MSDSs are scanned, assigned a number, and made available to all personnel. Personnel knew how to locate and retrieve an MSDS if needed.

During work observations, several flammable storage cabinets throughout the site revealed that BBWI controls were not being consistently followed per MP-ISIH-2.5. That procedure required the NFPA 704 diamond label on secondary containers, but many secondary containers were observed that were not labeled. In one case, MSDS for a chemical located in a flammability cabinet did not have an MSDS in the electronic MSDS system, nor did it contain any warnings of the physical or health hazards. A posted ledger was recently attached to the outside of flammable cabinets, requiring chemical users to update inventory sheets when adding or removing chemicals. However, this revised requirement has not been communicated to the

workforce or included in the procedure and, subsequently, has not been followed by the workforce. BBWI should revisit implementation of the Hazard Communication Program, especially MP-ISIH-2.5, to reflect recently implemented changes in maintaining inventory sheets on flammability cabinets, labeling all hazardous chemical containers in accordance with MP-ISIH-2.5, and updating inventory sheets to reflect current status of flammability cabinets per the updated procedure. The Hazard Communication Program training should be updated to reflect the specific responsibilities for all chemical users. These changes should be communicated to the workforce for implementation.

Opportunity for Improvement: BBWI should review implementation of the Hazard Communication Program to ensure requirements for labeling and inventory of chemical hazards are clear and understood by the workforce.

The Team observed cleanup of a diesel fuel spill on the west side of WMF-636. The spill resulted from overfilling the fuel tanks. As the temperature rose, the diesel fuel expanded in the tank. The procedure for operation of the heaters did not include specific instructions to prevent overfilling the fuel tank in the event of temperature increases. Although a "Just in Time" hazard assessment was performed for another spill cleanup, no similar assessment was performed for the cleanup observed by the Team. An RPTW was generated, and it took 2 days to complete the required hazard assessment and work control paperwork. The Spill Cleanup procedure states "if any of the flowing types of spills occur, notify environmental personnel to perform offsite notification – Above ground petroleum that is less than 25 gallons only if cleanup cannot be accomplished within 24 hours." Environmental personnel were not notified of this spill because workers believed spills on asphalt did not require notification. However, the Spill Cleanup procedure does not specifically differentiate notification conditions for spills on asphalt or on the ground. The procedure needs to provide clearer instructions.

Procedures for characterizing, sorting, creating, and shipping waste containers are written and followed verbatim, often using reader-worker routines to ensure waste meets the acceptance criteria for the applicable disposal site. BBWI also has a complete, detailed procedure set for waste retrieval, handling, and storage onsite. Procedures that do not affect the certification of waste for the final disposal site are not used as inhand procedures, nor are procedures regularly used for prejob briefings or regularly referenced by supervisors while conducting those operations. Instead, workers have developed a culture that relies heavily on AMOW to identify the hazards and precautions they should follow. Consequently, precautions and warnings in the procedures are not regularly reviewed, and additional precautions and warnings identified on AMOWs are not incorporated into procedures. AMOWs are generally written to cover several procedures or processes in an area of the plant. As a result, operators may not always be aware of which procedural step they are performing or which precautions and warnings from the procedure may apply. BBWI has been working to improve conduct of operations. As an additional improvement, BBWI should consider requiring supervisors to refer to procedures during waste retrieval, handling, and movement. When this was discussed with BBWI managers, ideas were already being evaluated that would make procedures easier for supervisors to use and handle during these operations.

Opportunity for Improvement: BBWI should emphasize more frequent procedural reference by supervisors to ensure workers are aware of and following prescribed hazard controls.

Preventive and corrective maintenance is performed by the onsite maintenance services. BBWI uses a computerized maintenance management system, called Maximo, to process and plan work orders. BBWI recently upgraded to the P6 Primavera system to assist in tracking work scheduling. The current backlog for corrective maintenance and preventive maintenance was not available. However, BBWI identified that many work requests that were postponed or given low priorities were often "lost" in the system and never revisited. The person assigned to track these low priorities has been reassigned and the position not backfilled. Many low priority actions have not been addressed for more than a year.

Opportunity for Improvement: BBWI should review the "lost" work requests that were postponed or given low priorities to ensure the work actions did not, or do not, represent a potential hazard to workers or the facilities.

Typically, a work request is generated electronically and assigned a unique number by Maximo. These work requests are routed to the Production Manager or other designated responsible manager. The Production Manager reviews the problem, confirms the scope of the work, and either assigns it a priority or cancels the work request. The Production Manager and the Maintenance Manager agree upon a weekly priority list and then work packages are created. The priorities are:

- ***Priority 1 - Critical.*** These include the potential to expose personnel to serious health and safety issues, including injury or death, may result in imminent and significant environmental damage, or may cause failure of a critical single point of failure system or component, which will result in immediate loss of production, or actions that are required to ensure TSR compliance.
- ***Priority 2 - Urgent***. These are safety issues that are nondynamic in nature or are of significant risk such that a system or process is shut down and noncompensatory measures are available.
- ***Priority 3 - Priority.*** Safety issues that are identified as correction of best management or that are mitigated through compensatory measures without assuming significant risk. Site Maintenance Priorities Schedule shows the priority work.

Priority 1 and 2 safety issues brought up during the assessment were addressed.

As a radiological facility, BBWI applies the requirements of 10 C.F.R. 835. The program is robust and technicians were observed performing contamination and dose rate surveys. Air sampling is done by both lapel (breathing zone) and general area. Postings and placards were observed to be correctly used and applied. The majority of BBWI employees are Rad Worker II trained. They are issued thermoluminescent dosimeters, and their radiation dose is monitored and tracked. Radiological monitoring is performed when Waste Handlers perform "surface processing" and "waste emplacement" activities. Waste handling work is performed per procedures, AMOWs, PTWs, RPTWs, and with Radiological Technician support involved. For example, at the TSA/RE Pad R, the Radiological Technicians were observed routinely surveying waste containers/boxes and shipping casks throughout the performance of the waste handling procedure.

An area focused on by BBWI over the past 3 years has been radiation dose reduction. A large contribution of the workers dose was recognized as simply personnel access in waste storage areas. Some drums may have relatively high dose rates and are appropriately labeled and segregated, but workers were not always minimizing their exposure to those drums. BBWI began issuing electronic pocket dosimeters to workers that provide an audible indication when the worker is standing in a higher dose rate area. This audible indication prompts the worker to move to a lower dose area if possible. As a result of the implementation of these devices, BBWI has realized a reduction of total dose commitment to the workforce of approximately 50 percent in the past 3 years.

Conclusion

BBWI has appropriate controls established and, with the exception of specific instances, those controls are well implemented and practiced. Hazards are well communicated and understood by the workers interviewed and observed. BBWI meets the expectations for the Hazard Prevention and Control tenet.

VII. SAFETY AND HEALTH TRAINING

Managers, supervisors, and employees must know and understand the policies, rules, and procedures established to prevent exposure to hazards. Training for health and safety must ensure that responsibilities are understood, that personnel recognize hazards they may encounter, and they are capable of acting in accordance with management expectations and approved procedures. The Safety and Health Training Program was evaluated by reviewing procedures; training material; records; attending selected training classes; and interviewing bargaining unit and exempt employees, supervisors, and managers in nearly all of the BBWI site and Idaho Falls facilities.

BBWI's Safety and Health Training Program is outlined and defined in PD-RTQP-01, *Training Program Description*. This training program description describes the organization, planning, and administration of the training program. The program applies to all aspects of BBWI operations, including personnel involved in the operation, maintenance, design, procurement, and support of these activities. It implements a systematic approach to training that is applied through implementing procedures.

BBWI requires all of its workers, supervisors, managers, and subcontractors to complete training required under DOE 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*. The Training Requirements Matrix lists the training requirements from BBWI procedures, target audience, and courses or qualifications that are used to meet the requirements. The document was originally issued in April 2008 and has several courses listed as "TBD", indicating that courses had not yet been developed to address the procedural requirements. A periodic review frequency for this matrix has not been established. The training matrix should be updated to reflect changes in the course status and procedure changes.

PD-RTQP-01, section 4.1, stipulated that all employees must take new employee orientation and access training prior to the employee's exposure to workplace hazards. This training consists of general description of activities in the facilities; job-related procedures, policies, and instructions; general employee radiation training; facility emergency plans; industrial safety and hygiene program; criticality safety; fire protection; security; quality assurance, and the environmental protection program.

BBWI places heavy emphasis on HPI. A total of 95 percent of BBWI workers have attended the HPI training. By providing HPI training to all the employees, BBWI focuses the workforce on prevention of accidents/incidents, awareness of potentially unsafe behaviors, and identification of accident precursors before the accident or injury occurs.

The Team had the opportunity to observe several training courses offered by BBWI during this assessment. Courses included sessions in new hire site access, hearing conservation, respirator and fit testing, pyrotechnics, hazard communication, KEYS, and HPI training. Based on these observations, BBWI training provided adequate information prior to the employees' exposure to workplace hazards. In all cases, the presentation material was informative and the concepts were presented in a way that could be understood by the students. The instructors were knowledgeable of the content and were able to answer the questions posed by the students. The settings were informal and the instructors encouraged student participation.

BBWI employees are provided additional training according to their Individual Training Plans (ITP). ITPs are normally prepared by the supervisors. In some cases, the supervisors may receive guidance and input from the SMEs and the training specialists. The ITP identifies the classroom and on-the-job training (OJT) that the employee must complete before exposure to hazards.

The contract between BBWI and IUOE requires employees to maintain core Operations Technician qualifications. To encourage advancement, the contract allows employees to advance to an Operations Technician II qualification by obtaining at least three qualifications in nonfacility areas and be qualified in at least two workstations in the facility. The contract provides monetary incentive to workers for having more than three workstation qualifications. The workers are rewarded 50 cents per hour in wages for each additional workstation qualification. If the workers fail to keep the additional qualifications current, they lose the additional pay.

The BBWI accountability system links entry at the facility access to the employee's access training. If access training has expired, the worker is denied entry. For other training, the employees may be given a grace period if the lapse was due to unavailability of training or other justifiable reason.

Initial training and retraining records are maintained in the Training Records and Information Network (TRAIN). The Training Department schedules training for the employees and notifies them by e-mail through 90-day, 60-day, and 30-day reminders. Presently, TRAIN lacks the capability to inform the supervisor at the same time it notifies the employees. The supervisor learns of the training from the employee or if the employee fails to take the training before its expiration.

BBWI subcontractors and visitors are also required to take training for access to BBWI facilities. Visitors, subcontractors, and vendors are provided training based on the length of time and complexity of the tasks they are performing. Necessary training is identified in AMOW or other work control documents and is specified in the contractual requirements or specified by the IH/IS and the Training Departments. Visitors and infrequent vendors are provided a briefing on hazards they may encounter and are escorted while onsite.

Newly hired employees undergo an intensive 2-week training program, starting with a 30-minute introduction usually given by the President and General Manager to emphasize the philosophies and priorities of the Management Team. The new employees are urged to "work efficiently, but in a safe and compliant manner." Additional training provided to all employees includes KEYS, HPI, and ESIT. Most workers also complete the 24-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Training required under 29 C.F.R. 1910.120, 8-hour HAZWOPER annual refresher training, and Radiological Worker training, and biannual refreshers.

Most equipment operation is developed through OJT. This training is provided by designated SMEs who are experienced in operation of various machines, such as forklifts, cranes, super compactor, and radiological monitoring equipment. New workers must also demonstrate their proficiency on the equipment to SMEs before OJT is completed. Once proficiency is demonstrated, the worker receives a qualification card for the specific machine or equipment. The card has a specified expiration date by which the worker must demonstrate proficiency to

keep the qualification current. The safety and health training program for supervisors and managers is also defined in PD-RTQP-01, section 4.1.3. Supervisors and managers attend the Safety Leadership Workshop developed by the Bechtel Group, Inc. The Team reviewed workshop material, which included a presentation by the BBWI President and General Manager outlining expectations of zero accidents, zero noncompliance, and the importance of positive reinforcement of employees and continuous improvement.

A program gaining support in general industry is the Safety Trained Supervisors (STS) Program. This program provides supervisors with a third-party certification by the Board of Certified Safety Professionals through the Council on Certification of Health, Environmental, and Safety Technologists. STS certification establishes a minimum competency in general safety practices. To achieve the certification, candidates must meet minimum safety training and work experience, and demonstrate knowledge of safety fundamentals and standards by examination. Those holding the STS certification must renew it annually and meet recertification requirements every 5 years. The program has proven effective at other sites in helping supervisors recognize potential unsafe acts and conditions and make improvements in safety. BBWI has not encouraged supervisors to pursue this certification, but may want to consider it as a potential means of gaining additional safety improvement.

Opportunity for Improvement: BBWI should consider encouraging supervisors and managers to pursue certification as an STS.

During review of training lesson plans and observing classroom training, the Team noted that most lesson plans were outdated. A few additional deficiencies were noted. For example, the lesson plan for the Respirator and Fit Testing course was undated and included a self-study video with practical application. However, during the training observed by the Team, the video was not used by the course instructor. Another plan did not reflect the most recent revision to the implementing procedure. Some courses required the attendees to pass a written examination, while other courses did not. The Training Manager stated that, effective January 2008, the President and General Manager decided all technical courses should include a test. However, this requirement had not yet been documented or implemented.

BBWI is slowly revising the lesson plans to make them current. A new lesson plan cover sheet and process has been implemented. Although not currently included, BBWI is planning further revisions to that cover sheet that will include the revision history and specify if a written test is required. While improvements continue to be made within the training program, efforts appear to be more in response to identified issues than in implementation of a defined, systematic approach to a comprehensive, rigorous, and effective training program. While a training program description exists, priorities for updating and maintaining some of the elements of the plan with appropriate milestones to correct deficiencies have not been specified.

The completeness and accuracy of training records have been self-identified as an area needing improvement (BBWI Management Assessment Report, MAR # 41084). Corrective actions are currently ongoing, including revision of MP-RTQP-14.19, *Training Records Administration*, and creation of a form to provide objective evidence that instructional materials, course files, analysis, qualification, and checklist templates are complete. However, there is not yet a written implementation plan to correct these deficiencies. BBWI should clearly prioritize the update and maintenance of these training elements and self-identified improvements in the training program.

This should include analyzing the BBWI training program to identify current and future training needs, evaluating and incorporating regulatory drivers, and assigning appropriate resources to address full implementation of the program plan. Appropriate milestones should be developed to fully implement the plan.

Opportunity for Improvement: BBWI should clearly prioritize the update and maintenance of instructional materials, course files, and qualification records, as well as other self-identified improvements of the training program.

Conclusion

BBWI provides safety and health training to managers, supervisors, and employees. Workers generally know and understand the policies, rules, and procedures established to recognize hazards they may encounter and prevent exposure to these hazards. Assessments continue to find opportunities for improvement within the training program. While improvements continue to be made, efforts appear to be more in response to identified issues than in implementation of a defined, systematic approach to a comprehensive, effective training program. BBWI should be able to gain significant improvement in the overall safety and health training by prioritizing the updating and maintenance of elements and self-identified improvements of the training program.

VIII. CONCLUSIONS

Since taking over the contract for operation of AMWTP in 2005, BBWI has made great strides in improving the safety and operating efficiency of the plant. They have made significant investment in the safety and health program, recognized and encouraged worker participation and improvement suggestions, and built a strong safety culture of "Keeping Everyone and Yourself Safe." Managers and workers clearly work in partnership to ensure safe, compliant, and efficient performance. In their quest to obtain VPP Star status, they have focused heavily on the first two tenets of DOE-VPP, Management Leadership and Employee Involvement. Less emphasis has been placed on the other three tenets. The work control program has not been significantly changed since BBWI assumed the contract. As a result, work management systems remain in place that meet the overall intent of Integrated Safety Management, but are not well integrated and can lead to some weaknesses in hazard analysis and procedural compliance. While workers are aware of the dominant hazards in the workplace, the training program has significant opportunities to improve the identification of training requirements and ensure a systematic approach to training is established. Based on the strength of Management Leadership and Employee Involvement, the Team is confident that BBWI will take advantage of these opportunities for improvement to realize additional gains in safety, health, and production. The Team, therefore, recommends that BBWI at AMWTP be admitted into DOE-VPP at the Star level.

Appendix A

Onsite VPP Audit Team Roster

Management

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