



Washington TRU Solutions, LLC Waste Isolation Pilot Plant

**Report from the Department of Energy
Voluntary Protection Program
Onsite Review
February 23-March 6, 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 Washington TRU Solutions, LLC, at the Waste Isolation Pilot Plant during the period of February 23-March 6, 2009, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding its continued participation in DOE-VPP as a Star site.

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS.....	iv
EXECUTIVE SUMMARY	v
OPPORTUNITIES FOR IMPROVEMENT.....	vi
I. INTRODUCTION	1
II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE	3
III. MANAGEMENT LEADERSHIP	4
IV. EMPLOYEE INVOLVEMENT	11
V. WORKSITE ANALYSIS	14
VI. HAZARD PREVENTION AND CONTROL	19
VII. SAFETY AND HEALTH TRAINING.....	24
VIII. CONCLUSIONS.....	27
Appendix A	A-1

ABBREVIATIONS AND ACRONYMS

BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CH	Contact-Handled (TRU waste)
CHAMPS	Computerized Maintenance Tracking System
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
DART	Days Away, Restricted or Transferred
DOE	U.S. Department of Energy
DSA	Documented Safety Analysis
EM	Office of Environmental Management
HWDU	Hazardous Waste Disposal Units
HERE	Horizontal Emplacement and Retrieval Equipment
HSS	Office of Health, Safety and Security
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
MOU	Memorandum of Understanding
NAICS	North American Industry Classification System
NMED	New Mexico Environment Department
OSHA	Occupational Safety and Health Administration
Parking Area Unit	Parking Area Container Storage Unit
PPA	Property Protection Area
PPE	Personal Protective Equipment
RH	Remote-Handled (TRU waste)
SME	Subject Matter Expert
STR	Subcontractor Technical Representative
Team	Office of Health, Safety and Security DOE-VPP Team
TRC	Total Recordable Case
TRU	Transuranic waste
TSR	Technical Safety Requirements
U/G	Underground
USW	United Steel Workers
VPP	Voluntary Protection Program
WHB	Waste Handling Building
WHB Unit	WHB Container Storage Unit
WIPP	Waste Isolation Pilot Plant
WTS	Washington TRU Solutions, LLC

EXECUTIVE SUMMARY

Washington TRU Solutions, LLC (WTS), is the management and operating contractor for the Waste Isolation Pilot Plant located outside Carlsbad, New Mexico. The plant began receiving contact-handled waste in 1999 and remote-handled waste in 2007. Initially managed by Westinghouse TRU Solutions, LLC, the contract transitioned to WTS in 2003. Westinghouse TRU Solutions, LLC, entered the Department of Energy (DOE) Voluntary Protection Program (VPP) at the Star level in 1994. The DOE-VPP Star was transferred to WTS in 2004 with the previous triennial reassessment completed in 2005.

This report documents the results from a triennial reassessment conducted from February 23-March 6, 2009.

Since the last reassessment, WTS has been subjected to significant operational and performance pressures. This pressure comes externally from DOE and internally by the WTS contract structure and self-imposed production pressures by the workforce. Increased rates of waste processing are essential to helping DOE achieve its environmental restoration mission from the legacy of the cold war. Additionally, WTS is paid by DOE based on the quantity of waste (either weight or volume) emplaced. In some cases, those pressures have contributed to a perception by some members of the workforce that production was being placed ahead of safety. These pressures and perceptions are contributing to a breakdown in communications between the workforce, primarily the bargaining unit and the management team. Recognizing this situation, WTS has taken several bold steps in the past few months to self-identify problems, make necessary improvements to systems and equipment, improve the clarity and usability of procedures, increase involvement of workers, and work to promote an atmosphere of safe, compliant production. Many corrective actions have been taken, including a shutdown of waste receipt and handling at the site, while improvements were made to procedures and more general conduct of operations. These corrective actions are beginning to have an effect on the safety culture at the site; however, additional time is needed to mature and demonstrate effectiveness for the long term. The DOE-VPP Team is recommending that WTS continue to participate in DOE-VPP at the Star level on a conditional basis, while WTS addresses the opportunities identified in this report. The Office of Worker Safety and Health Assistance will conduct a followup assessment in 12 months to make a final determination on WTS' continued participation.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
WTS should ensure appropriate personnel are identified, trained, and appointed as supervisors within the Radiological Controls organization, such that Radiological Control Technicians' timecards are not approved by Waste Handling Engineers.	6
WTS should continue and expand efforts to build trust between workers and managers, including leadership training, mentoring, worksite visibility, and team building seminars. Managers must find positive ways to identify and prevent workplace activities, such as pranks and derogatory statements that discourage reporting of safety issues and breakdown trust and confidence.	7
WTS should revise annual employee share goals to remove direct references to TRC and DART rates, and replace those goals with positive actions employees can take that will work to improve those rates.	8
WTS must promote critical annual self-assessment in connection with the annual VPP report, and use that assessment as a way to develop annual Safety Improvement Plans.	8
WTS should consider providing training to both workers and managers on "Active Listening" techniques and consider the use of team building seminars for work groups to stimulate more effective communication between managers and workers.	9
WTS should review all the closed actions from the VPP Gap Analysis to ensure the underlying cultural issues were appropriately addressed, and leave the corrective actions open until positive indicators of cultural shifts can be identified.	9
Ensure that the bargaining unit and managers continue building and strengthening their relationship regarding the handling and tracking of safety concerns.	12
WTS must create a working environment for all workers that encourages and rewards the reporting of injuries, near-misses, close calls, or safety concerns without any fear of retribution from peers and/or managers.	13
WTS should reevaluate the new JHA procedure for completeness and effective application to ensure all hazards are analyzed, the analysis supports the specific controls identified, and each of the controls is implemented through procedures, training, postings, monitoring, or other means such that the worker understands the specific control expectation at the time of work.	16
WIPP needs to review OSHA Underground Construction and MSHA	17

requirements and analyze appropriate controls for the maintenance office areas and miners' break rooms. WIPP should install emergency lighting in the described areas if they wish to adopt OSHA Underground Construction requirements to ensure personnel can locate self-rescue devices in the event of power failure. Immediate measures should include requiring belt or hand-held lamps until emergency lighting can be installed.	
After revising the JHA procedure, WTS should implement a comprehensive training program for development of JHAs for personnel that are expected to be involved in creating the JHA. Focus should be on expectations, performance, and quality of the end product.	17
WTS should revise the General Employee Training to ensure newly hired personnel adequately understand the relationship between ISM and VPP, the relationship of the five tenets of VPP, and their personal role in maintaining DOE-VPP Star status.	24
WTS needs to develop a reliable and effective system to ensure the Mine Safety Procedures' 5-day limit is enforceable to all non-40-hour mine safety-trained individuals accessing the mine.	25
Clear standards for demonstration of proficiency in equipment operation should be established and maintained, such that proficiency is not determined based on individual preference or work schedules. Individuals specified to "sign off" on qualification cards should be given training on application of those standards to ensure uniform application.	26

I. INTRODUCTION

The Waste Isolation Pilot Plant (WIPP) is the Nation's solution for permanently disposing of defense-related transuranic (TRU) waste currently in temporary storage at U.S. Department of Energy (DOE) sites across the country. Authorized by Congress in 1979 and operational since March 1999, WIPP has received more than 6,000 waste shipments, safely disposing more than 56,000 cubic meters of transuranic waste in the repository located nearly one-half mile underground. Washington TRU Solutions, LLC (WTS), is a partnership between Washington Government Environmental Services Company and Weston Solutions. WTS is the managing and operating contractor for WIPP.

The WIPP facility has been divided into functional areas. The Property Protection Area (PPA), surrounded by a chain-link security fence, encompasses 34.16 acres and provides security and protection for all major surface structures. The DOE Off Limits Area encloses the PPA and is approximately 1,421 acres. These areas define the DOE exclusion zone within which certain items and material are prohibited. The final zone is marked by the WIPP Site Boundary (WIPP land withdrawal area), a 16-section Federal land area under the jurisdiction of DOE.

There are three basic groups of structures associated with the WIPP facility: surface structures, shafts, and underground structures. The surface structures accommodate the personnel, equipment, and support services required for the receipt, preparation, and transfer of TRU mixed waste from the surface to the underground. These include office space, cafeteria facilities, training classrooms, and maintenance shops. There are two surface locations where TRU mixed waste is managed and stored. The first area is the Waste Handling Building (WHB) Container Storage Unit (WHB Unit) for TRU mixed waste management and storage. The WHB Unit consists of the WHB contact-handled (CH) Bay and the remote-handled (RH) Complex. The second area designated for managing and storing TRU mixed waste is the Parking Area Container Storage Unit (Parking Area Unit), an outside container storage area that extends south from the WHB to the rail siding. The Parking Area Unit provides storage space for up to 50 loaded CH Packages and 12 loaded RH Packages on an asphalt and concrete surface. Four vertical shafts connect the surface facility to the underground. These are the Waste Shaft, the Salt Handling Shaft, the Exhaust Shaft, and the Air Intake Shaft. The Waste Shaft is the only shaft used to transport TRU mixed waste to the underground. The WIPP underground structures are located in a mined salt bed 2,150 feet below the surface. The underground structures include the underground Hazardous Waste Disposal Units (HWDU), an area for future underground HWDUs, the shaft pillar area, interconnecting drifts, and other areas. The underground HWDUs are defined as waste panels, each consisting of seven rooms and two access drifts. The WIPP underground area is designated as Panels 1 through 10, although only Panels 1 through 7 are currently permitted. Each of the seven rooms is approximately 300 feet long, 33 feet wide, and 13 feet high.

In September 1994, WIPP, managed by Westinghouse TRU Solutions, LLC/Westinghouse Waste Isolation Division, was certified as a DOE Voluntary Protection Program (VPP) Star site, the first in DOE. The first recertification at WIPP occurred in May 1999, with the second in September 2002. Subsequently, a contract change occurred and WTS assumed management of WIPP. WTS was recertified as a DOE-VPP Star site in September 2005. Per DOE-VPP requirements, the fourth triennial recertification review was due in 2008. The purpose of this recertification is to determine whether WTS continues to meet the expectations for continued participation in DOE-VPP.

Since the last recertification in 2005, WTS has had record years for the number of waste shipments received and processed, has had significant reductions in its accident and injury statistics, and in 2007 began receiving higher activity “RH” wastes. These accomplishments have been significant for DOE cleanup and restoration activities across the country.

Assessment activities included extensive tours and work observations both above and below ground, including both CH and RH wastes, from receipt through emplacement, mining activities, maintenance, and operations, as well as worker and manager interviews. The assessment team had contact with over 100 employees, including bargaining and nonbargaining unit workers, supervisors, and managers. The primary hazards at WIPP include the radiological and chemical hazards associated with the wastes, heavy equipment operation, and mining hazards, as well as the range of standard industrial hazards (electrical, rotating machinery, elevated work, and confined spaces).

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (WTS)					
Calendar Year	Hours Worked	Total Recordable Cases	Total Recordable Case Incidence Rate	DART* Cases	DART* Case Rate
2006	1,212,904	6	0.99	1	0.16
2007	1,238,744	1	0.16	0	0.00
2008	1,363,699	1	0.15	0	0.00
3-Year Total	3,815,347	8	0.42	1	0.05
Bureau of Labor Statistics (BLS-2007) average for NAICS** Code # 5622 Waste Treatment and Disposal			6.7		4.3
Injury Incidence/Lost Workdays Case Rate (WTS Subcontractors and Vendors)					
Calendar Year	Hours Worked	Total Recordable Cases	Total Recordable Case Incidence Rate	DART* Cases	DART* Case Rate
2006	539,660	0	0.00	0	0.00
2007	648,895	4	1.23	2	0.62
2008	664,965	0	0.00	0	0.00
3-Year Total	1,853,520	4	0.43	2	0.22
Bureau of Labor Statistics (BLS-2007) average for NAICS** Code # 5622 Waste Treatment and Disposal			6.7		4.3

* Days Away, Restricted or Transferred

** North American Industry Classification System

Total Recordable Case (TRC) Incidence Rate, including subcontractors: 0.42**Lost or Restricted Workday Case Incidence Rate, including subcontractors: 0.11**

WTS accident and injury statistics are a very small fraction of the comparison industry averages. As discussed below, there is some indication that some employees are reluctant to report injuries, which may be masking the actual trend in accident and injury rates. However, in order for those rates to exceed the comparison industry average would require that WTS have over 45 recordable cases per year. Based on the team's review, it is not likely that the statistics are inaccurate to that degree. Consequently, from a statistical perspective, WTS continues to meet the requirements for participation in DOE-VPP at the Star level.

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: clearly communicated policies and goals, clear definition and appropriate assignment of responsibility and authority, adequate resources, and accountability for both managers and workers. Finally, managers must be visible, accessible, and credible to employees.

WTS managers consistently voiced their support for workers performing the WIPP mission in a safe and compliant manner. That commitment is stated throughout many WTS documents and policies as “protection of the safety and health of WIPP workers, visitors, and the public is the number one priority for the conduct of WIPP operations.” That commitment was reiterated in a written “Assurance of Commitment” signed in February 2009 by the President and General Manager of WTS. Interviews with managers, as well as observations during staff meetings, and other interactions with the team confirmed this commitment is formally established and communicated.

Resources for safety and health were not identified as a problem by any of the personnel interviewed. The safety and health organization is staffed with a sufficient number of safety professionals. Work observations and interviews by the Office of Health, Safety and Security (HSS) DOE-VPP Team (Team) showed consistent support of the safety professionals and their availability to provide support. Funding for safety and health improvement initiatives (promotions, recognition, and awards) was increased in Fiscal Year 2009. Discussions during the assessment indicated that as a result of the American Recovery and Reinvestment Act of 2009, appropriations may be available to purchase new equipment that would help improve safety and health.

The managers' concern and commitment were demonstrated during an unfortunate accident that occurred during this VPP assessment. A worker was crushed between the seat of an industrial cart and the tongue of a waste hauling trailer when the cart drove underneath the tongue. The cause was still being investigated as of the close of this assessment. The crushed worker was hospitalized for more than 5 days, requiring initiation of a Type B investigation. From the beginning of the event, managers were proactive in ensuring the worker received appropriate medical treatment. They took action to ensure the worker's parents were brought from Mexico to the hospital, and arranged for hotel rooms in Carlsbad and later in Lubbock, Texas, where the worker/patient was moved. Furthermore, management ensured that there was a nurse present with the worker as an advocate between the worker and the hospital. In addition, a WTS manager was present for the duration of the worker's hospital visit providing information and support to the worker and the family. The WTS investigation team convened immediately after the accident and consisted of both managers and union safety representatives.

In the past several months, WTS requested assistance from its parent corporation to conduct two separate assessments focused on the safety culture at WIPP. The first assessment was an Expert Review of WTS conducted July 7-30, 2008. That report was an excellent, critical

self-assessment that indicated some significant areas where WTS needed to make improvements in each of the Integrated Safety Management System core functions. The second assessment was a corporate level VPP Gap Analysis conducted by several URS-Washington Group employees from other VPP sites. That team concluded:

The Team feels a lack of understanding exists between management and the workforce concerning safe work practices. From employee interviews it was concluded that in some cases, production reigns over safety while manager interviews depicted just the opposite. It is the conclusion of this team that in order for WIPP to be successful in achieving VPP Star recertification, this condition has to be corrected so that all employees feel safety is the number one value at WIPP. In addition, WIPP currently does not have a written commitment from the bargaining unit stating support of VPP. This fact also jeopardizes successful VPP Star recertification.

WTS has responded with a degree of urgency to both these assessments by developing detailed corrective action plans, documenting the completion of corrective actions, and establishing a Corrective Action Review Board that is responsible for ensuring the corrective actions are effective. WTS also placed one of the members of the Expert Review Team into the Manager of Operations and Waste Disposal position. That individual was cited by many workers and managers as being a very positive change agent. As the new manager, he recently conducted a meeting with his entire management and supervisory team. He used that occasion to lay out his expectations for leadership, not just management, and defined what that meant. He reinforced the message that WTS needed to use the self-identified issues to drive cultural changes. Interviews with workers and managers alike demonstrated that those cultural changes were beginning to take effect. Many other corrective actions were also identified in response to the two assessments. External audits by DOE Deputy Assistant Secretary for Safety Management and Operations, Office of Nuclear Material and Facility Stabilization, within the Office of Environmental Management (EM), and the Defense Nuclear Facility Safety Board attested to the short-term effectiveness of those corrective actions. As discussed in the ensuing paragraphs, WTS needs to sustain its efforts to demonstrate the long-term effectiveness of those corrective actions.

In the wake of the Expert Review Team, WTS shut down its operations last year to address the conduct of operations and nuclear safety issues identified in that report. The resumption of activities included reviewing and revising all procedures. Procedures were reviewed and validated by using reader/worker routines. As a result of those reviews, many procedures were identified that did not work as written, despite the fact that the procedures had passed the operational readiness review process. WTS is continuing to reinforce to workers that procedures must be correct, or the operation must be stopped, placed in a safe configuration, and the procedures revised as necessary. The shutdown of operations had significant effect on other DOE sites that require WIPP to accept waste in order to meet negotiated milestones. Despite the potential effects, the DOE Assistant Secretary for EM has supported WTS in its efforts to make the cultural improvements identified by the Expert Review Team.

A second action related to recommendations by the Expert Review Team was included in an extended planned maintenance outage, extending more than 10 weeks. This outage was critical to making equipment repairs to safety systems to prevent degradation over time. The Expert Review Team had noted that formalizing a life extension process was necessary to ensure that

degradation of equipment over time would not impact safety systems essential to the Category 2 Nuclear Facility. Those plans had already begun and actions were included in the outage. The outage ended only a short time before the start of this VPP triennial reassessment.

Particularly problematic in the VPP Gap Analysis was the lack of support from the bargaining unit (United Steel Workers (USW), Local 12-9477). The Local Union had been requested to sign a letter expressing its support, but the Local Union President had refused to sign. That refusal was based on several factors, but the overriding concern was that the Union President did not believe that WTS was achieving the level of performance in the tenets of VPP that warranted participation in the program. Subsequent discussions between the WTS General Manager, the Union President, and the Director of the Office of Worker Safety and Health Assistance, helped clarify that the Union commitment was not an agreement that WTS was performing at the expected level, but that the Union was committed to working with WTS managers to achieve that level of performance. After those discussions, WTS and the USW Local President established a more effective discussion of the issues, and the Union President signed a letter of commitment to VPP on January 22, 2009.

WTS is organized as a production organization with the essential functions for receiving, handling, and emplacing wastes reporting to the Site Operations and Disposal Manager. Other support functions, such as Engineering, Business Management, Quality Assurance, Performance Assurance, and Safety, report to other managers outside the Site Operations and Disposal organization. An exception to this is the Radiological Controls Organization. The VPP Gap Analysis team recommended that radiological control personnel should have an autonomous reporting chain to maintain objectivity and checks and balances. Additionally HSS received a letter from a group of radiological control technicians that was concerned about the radiological control program at WIPP. The Team had extensive interaction with the Radiological Control Technicians during this assessment, and used the opportunity to better characterize the problems reported. It was evident to the Team that the concerns of the Radiological Control Technicians are a microcosm of the larger labor management relations issues. The organizational structure can work, but a significant problem to be resolved is that the Radiological Technician Supervisors do not have authority to approve the timecards for the Radiological Control Technicians. Instead, the timecards are approved by the Waste Handling Managers. This situation gives the appearance of compromising the independence of the Radiological Control Technicians to enforce DOE radiological standards and WTS operating procedures, which can affect operations milestones, and should be corrected by WTS as soon as practical.

Opportunity for Improvement: WTS should ensure appropriate personnel are identified, trained, and appointed as supervisors within the Radiological Controls organization, such that Radiological Control Technicians' timecards are not approved by Waste Handling Managers.

A central issue that WTS needs to improve, as identified in the VPP Gap Analysis, is the workers' perception that, at times, production pressures override safety. The pressure comes externally from DOE and internally, by the WTS contract structure and self-imposed production pressures by the workforce. Increased rates of waste processing are essential to helping DOE achieve its environmental restoration mission from the legacy of the Cold War. Additionally, WTS is paid by DOE based on the quantity of waste (either weight or volume) emplaced. Based on observations and interviews by the Team, both managers and workers contribute to this perception. Managers have contributed over several years by a lack of visibility in the

workspaces (both above and below ground), through verbal emphasis on production (however well-intentioned), by not communicating results of safety concerns raised by workers, and through the awards and performance incentives provided to workers. Workers have contributed by not raising safety concerns or by not supporting other members of their work crews that raised safety concerns, by communicating production pressures to their peers, through pranks targeted at other workers that do voice concerns, or by inappropriately raising issues as safety concerns that are not related to safety. A significant contribution to this perception is that some workers do not believe their supervisors are held accountable when production over safety concerns is identified (see issue of safe production described in the Hazard Prevention and Control section). The resulting environment has become one of distrust between workers and managers.

This situation is improving, but WTS has more work to do to regain the trust of the whole workforce. Senior managers must become more frequently visible in the workplace to ensure their presence is credible, not just a passing effort. Their presence must reinforce to middle managers and work supervisors the WTS commitment to a safe, compliant production. Managers must not be simply present, but must demonstrate the questioning attitude they expect from the workers and safety compliance from supervisors. They must use the opportunities workers present them with to demonstrate their commitment to correct any identified problems, and ensure the management systems work efficiently and effectively to support the safe, compliant production desired. Workers must accept their responsibility for the situation, and prevent themselves from pursuing production over safety. They must hold their peers accountable, and ensure every worker on a crew accepts an individual's safety concern as valid. Workers must stop playing pranks, no matter how well-intentioned, as these serve only to break down trust in the work environment and contribute to a fear of reprisal. Both workers and managers must find productive ways to hold each other accountable for raising and addressing safety issues, and not cultivating a culture of fear or reprisal.

Opportunity for Improvement: WTS should continue and expand efforts to build trust between workers and managers, including leadership training, mentoring, worksite visibility, and team building seminars. Managers must find positive ways to identify and prevent workplace activities, such as pranks and derogatory statements that discourage reporting of safety issues and break down trust and confidence.

Safety goals used by WTS in the past have strongly emphasized lagging indicators of safety culture. In 2008, WTS had to meet specified TRC and DART rate goals in order for workers to receive 50 percent of their bonuses. The other 50 percent was dependent on the individual worker not getting hurt. The result of this emphasis has been peer pressure among the workforce to not report injuries or illnesses, fearing that a work group would not receive its full share. This year, the goals have been modified to only 30 percent of the employee share related to TRC and DART rate goals, but workers interviewed still indicated a hesitance to report injuries. While it is understood that DOE establishes corporate performance goals for WTS based on TRC and DART rates, it is imperative that WTS define and reward the actions that will lead to achieving those goals. Employee bonuses need to be tied to actions they can take rather than events that do not occur in order to promote the safe, just culture expected of a VPP Star site.

Some employees have specific and targeted safety objectives, such as Safety-Trained Supervisor training. For most nonbargaining unit employees, supervisors, and managers, annual performance development plans contain a standard safety and health element. That element is

very broadly worded and is left to the interpretation of the employee and his or her supervisor. WTS should use this process, combined with more effective safety improvement plans identified previously, to identify specific safety goals that each employee can meet and include achievement of those goals in the performance development process.

Some workers indicated that some injuries and illnesses were not being reported as a result of concerns over employee bonuses. At least one employee interviewed by the team believed that WTS, in the course of trying to manage the case, had actively worked to keep his injury from becoming recordable or reportable. The Team's review of the case did not identify any proof or overt actions. Some statements made by medical personnel may have been misunderstood or misinterpreted by the worker, but that does not absolve WTS of its responsibility to avoid any appearance of discouraging or minimizing the worker's injury. As a result of these concerns, the low TRC and DART rates reported by WTS may not be accurate. While there is no indication that the TRC or DART rates are so inaccurate that they are to be above the average for the comparison industry, it is possible that the workers' fear of reporting may be masking an adverse trend in those statistics. WTS must remove barriers to workers' reporting of accidents or injuries and find more effective leading indicators to validate the accuracy of TRC and DART case reporting. WTS should revise annual employee share goals to remove direct references to TRC and DART rates, and replace those goals with positive actions employees can and are already taking that will work to improve those rates. Goals to consider include completion of Human Performance Improvement training, percentage of job hazards analyses revised, number of worksite observations performed and documented, number of lessons learned or safety shares submitted by workers, and attendance or participation in corporate safety promotions.

Opportunity for Improvement: WTS should revise annual employee share goals to remove direct references to TRC and DART rates, and replace those goals with positive actions employees can take that will work to improve those rates.

The issues identified by both the Expert Review Team and the VPP Gap Analysis clearly point towards the lack of effective self-assessment by WTS. The issues identified have been building for several years, yet were not identified in VPP self-assessments, and corrective actions were not identified or included in annual Safety Improvement Plans. The lack of critical self-assessments was highlighted in both the Expert Review Team report and the VPP Gap Analysis. In order for WTS to demonstrate the continuous improvement essential to VPP participation, they must ensure that an effective self-assessment process is in place, used to develop goals and actions for the coming year, and that the improvement plan is accepted and followed by everyone at the site.

Opportunity for Improvement: WTS must promote critical annual self-assessment in connection with the annual VPP report, and use that assessment as a way to develop annual Safety Improvement Plans.

A complication being faced by WTS is communication of policies and procedures to the workers. In an age where many people are coming to rely on electronic communications (e.g., e-mail, Web access, cell phones), these methods are not always effective for much of the WTS workforce. Waste handlers and miners do not have ready access to any of these communications tools while working; however, some of these tools are available during breaks

in the underground break rooms. Workers are dependent on the verbal instructions provided to them by supervisors and coworkers at pre-shift briefings or throughout the workday. In this environment, rumors travel quickly, especially when a potential safety issue arises. For example, the day after the cart accident, many workers believed that a mechanical failure of the cart resulted in the accident and that the mechanical failure had not been properly reported. Some workers were angry that they had been accused of not reporting safety issues on electric carts when the exact opposite was true. Given the previously identified mistrust of workers, the message from the cart accident was misinterpreted and further eroded an already tenuous trust. WTS managers must find methods to effectively communicate to their workforce. They must ensure that the message to the workforce is not inappropriately “filtered” by the current culture, and ensure the workforce has effective means to provide feedback directly to managers when concerns arise or when the message seems incongruous with corporate policy or objectives. Both managers and workers must learn to actively listen, seeking first to ensure they truly understand the message being communicated.

Opportunity for Improvement: WTS should consider providing training to both workers and managers on “Active Listening” techniques and consider the use of team building seminars for work groups to stimulate more effective communication between managers and workers.

As previously stated, the Expert Review Team and the VPP Gap Analysis Team did a commendable job in identifying weaknesses in the WTS safety culture and management processes. Corrective actions in some cases are still ongoing, but many of the corrective actions are already considered complete. In the case of the VPP Gap Analysis, some of those corrective actions are either too narrow to address the cultural issues identified or have been prematurely closed. For example, the VPP Gap Analysis Team identified that guidance for Job Hazard Analyses (JHA) lacked the rigor to provide consistency in the development and analysis of hazards. JHAs have been repeatedly identified as inadequate. The Type B investigation of the cart accident occurred after this VPP onsite assessment, but the report, which was published before this VPP assessment report, was completed and identified the lack of a JHA as a contributing cause to the cart accident. To date, actions to revise and improve the JHA process have not been effective. WTS analysis of the extent and impact of this opportunity for improvement addressed only the documentation of mitigation actions, and nothing about hazard analysis. As discussed in Work Site Analysis, JHAs reviewed by the HSS DOE-VPP Team lacked analysis of hazards and is a significant weakness in the process. WTS response to the VPP team recommendation was that “standardizing the method of documenting job hazard analyses at this time would require major changes for several organizations and would serve only to facilitate auditing” and no action was taken.

The VPP Gap Analysis also recommended that “WIPP should evaluate the communication processes and techniques across the Project. Improvement is needed in communication between shifts, as well as between management and crafts.” The identified corrective action was limited to improving repeat backs, shift turnovers, pre-job briefings, logkeeping, and post-job reviews. The cultural issues of communications were not evaluated or addressed in the corrective action plan.

Finally, and the most compelling example was the VPP Gap Analysis Team identified several employees that stated that when they had used Stop Work, first line supervisors had assigned

them to other jobs and assigned other workers to perform the work that was stopped. WTS evaluated the issue as simply being portrayed to the URS Corporation's corporate VPP Review team in interviews, and claimed "we do not know enough yet to determine whether it's perception or real." The corrective action was to conduct a separate analysis, and finally publication of a "Safety Knews" article and training for the workers on Stop Work. No corrective actions to address managers and supervisors' response to Stop Work were identified. Although this issue was closed

February 20, 2009, the Team heard and found evidence of this as a continuing concern among workers. As a result, WTS should reopen each of the recommendations raised by the VPP Gap Analysis Team, and review each recommendation in light of its cultural significance. Corrective actions should be modified and measures of effectiveness determined (e.g. cultural surveys among the workers) before the corrective action plans are accepted as complete.

Opportunity for Improvement: WTS should review all the closed actions from the VPP Gap Analysis to ensure the underlying cultural issues were appropriately addressed, and leave the corrective actions open until positive indicators of cultural shifts can be identified.

Conclusion

WTS Managers are committed to performing the WIPP mission in a safe and compliant manner. Production pressures and weaknesses in communications have contributed to misperception between workers and managers regarding that commitment, and in some cases have led to distrust. WTS proactively conducted two very important critical self-assessments that identified several necessary improvements in conduct of operations, compliance, and safety culture. Corrective actions have either been completed or are ongoing and are expected to address most of those concerns. In some cases, corrective actions have not been sufficiently widespread, or have been closed out before the corrective actions have demonstrated effectiveness. Improvements in manager training to focus on leadership are ongoing, but not yet complete. Many of the changes implemented in the past several months need additional time to mature and become ingrained into the WTS culture.

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 WIPP employees generally remain committed to their personal safety, as well as the safety of their coworkers and facility visitors.

The review team interviewed employees across the WIPP organization that included intown and site office workers, site engineers, trainers, miners, waste handlers, and division supervisors and managers. All intown personnel (office workers) indicated they were very involved in the WIPP safety program. Although not exposed to “traditional” hazards commonly found at the WIPP site, these workers were very aware of the hazards they are potentially exposed to in an office environment. Several interviews indicated the intown workers felt confident in stopping work if they felt uncomfortable, or saw something that could turn into a hazardous condition. They spoke highly of their participation in the safety fairs and awareness campaigns stating that they often were able to take several lessons/messages home with them. As a result of participating in these activities, one employee indicated: “I have the right to be safe everywhere I go,” then referenced her expectations of being safe when visiting public places.

All interviewed employees indicated WTS offers them several opportunities to actively participate in the safety and health program. In general, employees indicated they participate in safety fairs, awareness campaigns, safety and health training activities, regular walkthroughs of their workspaces and participate on safety committees. Several safety-related committees are in place at WIPP. Among them are the Radiological As Low As Reasonably Achievable Committee, the Operations Safety Team, the Human Performance Improvement Working Committee, the Underground Waste Disposal Working Group, and the Safety Awareness Committee. The Safety Awareness Committee provides support and manpower for activities that promote and encourage employee safety awareness. Members of this committee contribute ideas and suggestions for activities and identify specific safety trends, concerns, or issues that need to be addressed. They also participate in identifying concerns within their respective sections.

In 2006, the Integrated Waste Operations Safety Committee and the Underground Safety Team had become largely inactive. The committees were not meeting regularly, attendance at meetings was sparse, and the bargaining unit was dissatisfied with the performance of both committees. In response and out of a desire to increase employee involvement in safety, the bargaining unit and WTS managers agreed to form the Operations Safety Team. Comprised solely of bargaining unit membership with managers’ support, this team has become a positive influence in improving the bargaining unit efforts for greater worker involvement in safety concerns. The team has created a forum where safety issues can be effectively voiced, as well as tracked to closure. Some activities that have led to a safer work environment headed by the Operations Safety team are: members conducting periodic pre-Mine Safety and Health Administration (MSHA) type inspections; adding reflective tape to gateposts for night work; and installing portable mine phones in active waste disposal rooms. Observations by the Team demonstrated the committee members’ determination to affect positive changes and ensure union members worked together with WTS managers to ensure a safe working environment.

In most cases, employees indicated they are encouraged to report safety concerns to their supervisors, as well as identify concerns in job planning activities, daily job briefings, or whenever the need arises. The WIPP form is used to capture employees' safety concerns, issues, or a requirement violation. The form allows the originator to describe the issue, any actions taken, and any potential or proposed solution. The form can be submitted anonymously and placed in a drop box if the originator so chooses, or it can be submitted to the WIPP Form Coordinator. The form is then screened and assigned to the proper individual and tracked to closure. If an employee has an equipment concern, an Action Request is submitted to the appropriate supervisor and assigned accordingly. During the course of this review, discussions were held with managers and workers to identify ways to improve the reporting and tracking process. However, some interviewees indicated past handling of Action Requests has led to a breakdown in the relationship between their managers and the bargaining unit that has discouraged employee involvement, especially among waste handlers. The process to handle Action Requests was recently modified to ensure all requests are appropriately reviewed by managers, and appropriate corrective actions are identified and prioritized (See Hazard Prevention and Control).

Opportunity for Improvement: Ensure the bargaining unit and managers continue building and strengthening their relationship regarding the handling and tracking of safety concerns.

Several bargaining unit employees noted that although they wanted to be more engaged in the hazard analysis and work planning aspects of their work, there is a perception that mid-level managers do not fully embrace or encourage greater involvement. Waste handlers indicated they review the JHA or procedure after it has been completed and were receptive to more training on how to prepare and utilize the JHA. Waste handlers, for example, perceive a long history of ignored safety concerns, deteriorating equipment, and poor procedures that they have tried to address. They indicated they have had little or no success with the resolution of their concerns. One interviewee indicated that was the reason some waste handlers have requested transfers to other organizations even when it meant a cut in pay. Several other employees expressed relief, despite the pay cut, to be out of waste handling positions.

It appeared that goals and expectations of some first line supervisors and engineers were not always communicated effectively to the workers. The lack of effective communication has created a perception that some newer first line supervisors and engineers directing work were making decisions that place production over safety. The Team found that employees did indicate that when safety issues were elevated to management or if the newer first line supervisors and/or engineers consulted with more experienced personnel, the right decisions were being made. However, it was also noted by some that workers and supervisors sometimes do not give sufficient credibility to the safety and health expertise of other workers, which has also created the perception of disrespect (see Opportunity for Improvement under Management Leadership).

Employee reports of hazards at the facility are not only expected but also encouraged in the Integrated Safety Management System (ISMS)/VPP documentation and WIPP procedures. Interviews with many personnel indicated that they were comfortable with the ability and the expectation to identify and report hazards using the Action Request or the WIPP form. In the past, Action Requests were reviewed by a supervisor, and if the supervisor did not agree with the action, he or she could simply ignore it. Recognizing this problem, approximately 6 weeks before this VPP assessment, WTS implemented a new process that every action request was

reviewed by a joint panel of managers on a daily basis. Each Action Request was either moved to a WIPP form, a work order, or feedback was provided to the submitter if no action was necessary.

Some interviews indicated that if a worker was uncomfortable with the task to be performed, the supervisor found another worker to do the work. There appears to be some inconsistency in the application of the policy. Although not prevalent throughout the entire organization, the Team found some cases where employees feared retribution for raising safety concerns from both their peers and supervisors. Some workers reported they would be given less desirable jobs if they raised a safety concern, would become the target of pranks or practical jokes, or would be subjected to belittling language and treatment. Some employees indicated their biggest challenge at work was “not making a mistake” in fear of some type of negative consequence; this also appeared to be related to pressure not to report even minor injuries. In one case described to the Team, a worker submitted an anonymous Action Request, only to have the supervisor come into the daily pre-work meeting asking who submitted the ridiculous request. Although not pervasive, it was clear that some workers had developed a fear of reprisal based upon historical events for voicing safety concerns.

Opportunity for Improvement: WTS must create a working environment for all workers that encourages and rewards the reporting of injuries, near-misses, close calls, or safety concerns without any fear of retribution from peers and/or managers.

The WIPP safety program has continued to evolve over the years with some sections in the organization experiencing a shift in perceived expectations of safety and production. However, both workers and managers have demonstrated the willingness to improve communications that will allow them to better address safety concerns using existing tools, such as the WIPP Form and Action Request. In general, all employees indicated they strive to accomplish their mission in the safest manner possible and continue to make safety the top priority at the site.

Conclusion

The WTS workforce has a strong safety ethic that has existed for many years. Observations and interviews indicated employees sincerely look out for each other’s safety. However, improvements are needed to strengthen the trust throughout the entire organization. Workers and managers must continue to work together to end perceptions of disrespect, build trust, and work together toward a just culture. All workers must also strive to encourage coworkers to report injuries, near-misses, or close calls.

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.

The WIPP Authorization Agreement contains references to those documents that form the foundation for safe operation of the waste repository. An Authorization Agreement is required under the DOE ISMS and is required to be signed by both the Manager of the DOE Field Office 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, and the New Mexico Environment Department (NMED) Hazardous Waste Permit. WIPP has a DOE-approved Safety Basis and associated TSRs for receipt, emplacement, and mining operations at the site. This safety basis categorizes WIPP as a Category 2 Nuclear Facility and describes, analyzes, and documents the hazards and consequences of upset conditions for the operations at the WIPP site. The DOE-approved TSRs document those high level controls DOE depends upon for safe operation of the facility. The existing DSA included requirements from the NMED Hazardous Waste permit, which placed an extreme burden on WTS whenever changes were required to correct procedures. WIPP is currently in the process of implementing a new safety basis, which removes NMED permit requirements from the analysis and is expected to help improve the processes for maintaining the safety basis without reducing the safe operation of the site. The site expects to have the new DSA in place and implemented by June 2009.

The commitments flowing from the DSA are integrated into the programs and procedures the site uses to operate the facility. In 2008, WTS recognized the need to evaluate programs and operations at the site. An Expert Review Team, discussed in previous sections, was utilized to evaluate the programs and procedures employed at the facility. From this evaluation, the site was afforded insights into the effectiveness of programs supporting WIPP operation. A corrective action plan was developed by WTS and the site is in the process of making changes to programs and implementing procedures. One of the actions included the JHA procedure, which will be discussed later in this section. The VPP Gap Analysis (see Management Leadership) identified conditions and observations related to weaknesses in the hazards analysis process that were confirmed during this VPP assessment.

One program that is relied upon in the DSA for protection of the worker is the Industrial Hygiene Program. This program is integral to performing quality hazard analysis. Based on review of records and sampling data, the Industrial Hygiene professionals have an adequate hazard baseline document in place and are managing the periodic sampling, monitoring, tracking, and trending of hazards. Data is maintained in an electronic database that includes access to electronic Material Safety Data Sheet (MSDS), chemical inventories, and sampling data. The database currently is only available to the safety department and the Occupational Medicine

Group, but discussions with the safety professionals indicate the next step is to push the database usage throughout the entire site so all personnel have access to the data.

The flow down of commitments from the Authorization Agreement and DSA through programs and policies to the task level requires an implementing procedure at the worker level. The JHA procedure describes the process to be applied that satisfies the tenet of ISMS/VPP for hazards analysis. Since the Expert Review Team and VPP Gap Analysis indicated issues with the worksite analysis section of the VPP tenet, it was of particular interest during the Team's visit. One of the recommendations from the Expert Review Team included consolidation of JHA methods across the site. In November 2008, WTS issued a new procedure for development of JHAs. The Team reviewed this new procedure and identified a number of observations and conditions indicating continued weaknesses in the implementation and use of JHAs.

- The "Precautions and Limitations" section had several good instructions relating to using previously documented JHAs, currency of documentation, and utilizing personnel familiar with the work evolutions. The statement, "For proper performance, ensure JHA is written clearly and concisely," is, however, somewhat vague, especially in light of JHAs reviewed and discussed below.
- There are 3 steps defined in the general section of the procedure for developing the JHA: (1) separate the job or task into sequential steps; (2) for each step, identify the hazards if any; and (3) identify the best method of eliminating or mitigating each hazard." There is no mention of performing a Hazards Analysis or documenting that analysis. No guidance for performing analysis of the hazards is included or referenced.
- Under the Manager responsibilities section the first responsibility of the manager is "Determining for which jobs a JHA should be conducted." This is contrary to DOE Integrated Safety Management (ISM) guidance that all hazards should be analyzed.
- There are several areas in the procedure that reflect particular strengths that could be adopted in the general section of the JHA procedure. For example, Sections 2.1 and 2.2 are specific to Maintenance work, but include specific instructions to use a JHA checklist as a guide. Adopting this for all JHAs, not just maintenance, would reinforce and remind workers of the expectations and outcome of the JHA process. The Maintenance process also requires the personnel performing the JHA to "document the job site inspection." Adopting this for all JHAs would help provide a thorough understanding of the site, characteristics, and unique issues to be included in the hazards analysis. The section of the checklist referring to electrical hazards is suggested for all JHAs such that no electrical hazard is overlooked during the development of the JHA. The Maintenance section also requires "all identified hazards will be listed in the precaution section of the work instruction with reference to mitigating step or steps..." By listing the hazards upfront and linking them to the mitigators, the communication loop is closed in the work instruction.
- The Team reviewed numerous work procedures, work orders, and associated JHAs during the site visit. Typical waste handling procedures and JHAs did not link the documents with a reference. For example, the procedure for contact handled waste processing, *WP 05-WH1011 CH Waste Processing*, does not list or reference the JHAs that support the procedure or vice versa. The same issue was evident in *WP 05-WH1015 Preparation of CH Packaging for Empty Shipment*, *WP 05-WH1406 Conveyance Loading Car*, and

WP 05-WH1710 72B RH Processing. During a review of CHAMPS, (a computerized maintenance tracking system) Work Order 0711534 to reseal and stripe onsite roads, it was noted that all crosswalks inside the perimeter fence were painted over. Upon checking the Hazardous Waste permit Attachment G, it appeared the work order missed the environmental approval of “pedestrian traffic is limited to sidewalks and prominently marked crosswalks.”

- It is important in the development of the JHA that clear and concise information is documented such that the JHA becomes a useful tool to ensure the appropriate control set is identified and implemented. This specificity ensures controls are tailored to the hazard being evaluated. JHAs that were reviewed contained generic statements that were not clear and concise, and left the analysis and decision to the worker, rather than defining the specific, correct control. Examples include: (1) use proper cable-handling devices; (2) clean area and dispose of trash properly; (3) use proper tools; (4) use gloves when removing appliances; (5) wear gloves when handling Blue Ice or ice used for shipping; (6) use proper approved materials; (7) use proper lifting techniques; and (8) use proper brass tags, no gouges, tears, and in proper condition, and stable condition. These generic statements, such as “proper” or “adequate,” indicate the need for additional analysis specific to the identified hazard.

Opportunity for Improvement: WTS should reevaluate the new JHA procedure for completeness and effective application to ensure all hazards are analyzed, the analysis supports the specific controls identified, and each of the controls is implemented through procedures, training, postings, monitoring, or other means such that the worker understands the specific control expectation at the time of work.

Another essential element of hazard analyses is the determination of applicable regulations or standards. In one case observed by the team, WTS had deviated from the MSHA regulations for underground safety. Specifically, title 30, Code of Federal Regulations, part 57.17010, “Electric Lamps,” requires “Individual electric lamps shall be carried for illumination by all persons underground.” Additionally title 30, Code of Federal Regulations, Subpart N Personal Protection, 57.15031, “Location of Self-rescue Devices” requires:

- (a) Except as provided in paragraphs (b) and (c) of this section, self-rescue devices meeting the requirements of standard 57.15030 shall be worn or carried by all persons underground.
- (b) Where the wearing or carrying of self-rescue devices meeting the requirements of standard 57.15030 is hazardous to a person, such self-rescue devices shall be located at a distance no greater than 25 feet from such person.
- (c) Where a person works on or around mobile equipment, self-rescue devices may be placed in a readily accessible location on such equipment.

WTS has established a maintenance planning shop in the underground. That area is essentially an office type environment not typically present in commercial mining. This space consists of three areas. Each of the three areas is approximately 20 by 30 feet. The first room is occupied by maintenance and electrical workers and their cubicle workstations. The second room is elevated approximately 6 feet higher than the first room and serves as a conference room. The third room is located just off the conference room and consists of a set of cubicles typically seen in an office environment with files and computer workstations. Postings in the underground

maintenance office area and miners' break rooms indicated that hardhats and safety rescue breathers were not required to be worn in these spaces. WTS has provided additional support for the roof and ribs of those areas, the areas are well-ventilated, and are not located close to any mining or emplacement activities. While in those areas, workers did not carry their self-rescuers or miners lamps. This space did not meet the exceptions of being hazardous or mobile equipment. In this case, WTS had inappropriately relaxed the standards without reviewing the MSHA requirements.

The Occupational Safety and Health Administration (OSHA) and MSHA have a memorandum of understanding (MOU) that WTS might be able to apply in this situation. The MOU provides "where there is statutory coverage under the Mine Act but there exist no MSHA standards applicable to particular working conditions on such sites, then the OSHA Act will be applied to those working conditions." In this case, it might be appropriate to apply the OSHA Underground Construction standards, which might permit the relaxed requirements. Such an application should have been captured in the hazard analysis used to relax the requirements in the maintenance planning shop, but was not.

Opportunity for Improvement: WIPP needs to review OSHA Underground Construction and MSHA requirements and analyze appropriate controls for the maintenance office areas and miners' break rooms. WIPP should install emergency lighting in the described areas if they wish to adopt OSHA Underground Construction requirements to ensure personnel can locate self-rescue devices in the event of power failure. Immediate measures should include requiring belt or hand-held lamps until emergency lighting can be installed.

Interviews with a broad spectrum of personnel across the site indicated a lack of general knowledge regarding preparation, review, or use of JHAs. The involvement of the workforce in JHA is an essential element to ensure the work is understood and hazard controls can be implemented as expected. Many of the aboveground workers were not familiar with the core functions of ISMS or the five tenets of VPP. When asked about hazards analysis and involvement in the preparation of JHAs or procedure reviews, few workers responded in a positive fashion. Specifically, workers were asked about their involvement in developing JHAs, procedure development, and feedback for continuous improvement. The typical answer given by workers in waste handling was "we review the JHA or procedure after it's been done." Workers also indicated that they were very receptive to more training on how to prepare and utilize JHA.

Opportunity for Improvement: After revising the JHA procedure, WTS should implement a comprehensive training program for development of JHAs for personnel that are expected to be involved in creating the JHA. Focus should be on expectations, performance, and quality of the end product.

WTS has a system in place that evaluates upsets and identified abnormal conditions, investigates to determine root causes, and applies corrective actions. The WTS 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. The Team reviewed the documentation relating to a previous accident involving an RH sling that failed and injured an employee. The documentation appeared complete, but there was no evidence of inclusion of corrective actions

into procedures or JHAs after the report was issued. During the site visit, there was an accident involving site workers operating an electric cart. Team members were invited to sit in on the investigation proceedings. The process was comprehensive and was ongoing when the team departed the site. A common element of the root cause analysis reports reviewed during this assessment was the weaknesses in the JHA process. This further supports the need for WTS to reevaluate and revise the JHA process.

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 WIPP. A review of documentation and employee interviews confirms that this process is effective. Trend analysis occurs for TRC and DART statistics, although as previously discussed, the TRC and DART data may not be as accurate as desired. Industrial Hygiene 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, tracking and trending is conducted by Industrial Hygiene regarding issues identified in periodic safety inspections to support the hazard baseline.

Conclusion

WTS has mechanisms that adequately 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 analysis need significant improvement to ensure all hazards are adequately analyzed, and that specific controls are provided and justified by the analysis. WTS should refocus and reenergize the entire workforce to become attuned and involved in the Worksite Analysis tenet. 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, and/or Personal Protection Equipment (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 engineering controls are the preferred method used by WTS, 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.

WTS utilized engineered controls to minimize worker exposure to hazards and reduce the need for additional PPE. For example, the mines ventilation system in conjunction with the systematic adjustment of dampers and registers allowed WTS facility operators to ensure sufficient airflow throughout the mine system so that proper air quality could be maintained even during diesel vehicle operations or waste emplacement activities. In addition, facility operations personnel perform flow velocity checks twice per shift at the active mining locations to assure diesel particulates and drilling debris are minimized at work locations.

Other engineered controls include the use of diesel-hydraulic bolt drill and driver vehicles to nearly eliminate the physical task of miners manually driving the thousands of rib and back bolts necessary to ensure the mine walls integrity. Another engineered control utilized by WTS is the use of the Horizontal Emplacement and Retrieval Equipment (HERE) machine to remotely install waste casks into the mine bore holes and minimize worker exposures.

In most work observations, workers were observed wearing the appropriate PPE, and the PPE was correct for the hazards encountered. Underground workers, including miners, electricians and waste handlers, were rigorous in their consistency in the proper use of PPE. After all the teams' work observations, only one example of inappropriate PPE use was observed. This involved an underground electrician working in a 480V panel without donning the appropriately rated gloves per WTS work controls.

MSHA requirements regarding mining PPE were strictly adhered to by all workers observed. Hardhat use, rescue air packs, and mining lights were all utilized prior to accessing the hoists for entrance to the underground.

Some weaknesses were identified in the JHAs reviewed regarding the level of detail pertaining to the hazard controls. These issues are discussed in the Worksite Analysis section.

The WIPP Occupational Medicine Program is staffed by two nurses and a coordinator in the health unit located onsite. WTS has contracted Industrial Health Service in Carlsbad, New Mexico, to provide a licensed physician for the site. In the event of an injury, the health unit can provide first aid treatment, and may also be used for collecting samples and minor testing. Should an employee require additional treatment, the nurse coordinates all visits to the

Carlsbad Hospital Emergency Room, the contract medical doctor, and the specialists recommended by the contract doctor. The nurse also accompanies the injured employees to the Carlsbad Hospital Emergency Room. For more significant injuries, the site has an ambulance and a staff of qualified Emergency Service Technicians that can provide immediate care and stabilize the patient for transport to Carlsbad. Carlsbad has a level 2 trauma center, and for more severe injuries, patients can be transported to a level 1 trauma center in Lubbock, Texas. Agreements for “intercepts” to transfer patients to Carlsbad are in place, and were demonstrated during the accident that occurred during this VPP assessment.

Medical personnel do not routinely visit the workspaces, but plan to do so when more resources become available. WTS has hired an additional occupational nurse that is in training. The Occupational Medicine group has established a set of requirements for testing based on individual worker occupations. For example, all individuals whose activities involve the use of respirators are required to have an annual pulmonary function test performed as part of their qualifications. Respirator users cited include the mine rescue workers, emergency medical technicians, radiation technicians, and waste handlers. All mine workers are required to participate in the hearing conservation program. The industrial hygienist performs the testing and sampling in the field. For example, the industrial hygienist will perform the noise sampling of all the mine vehicles every 2 years. In addition, the industrial hygienist performs other sampling for new processes or based on individual requests. This information is provided electronically to the Occupational Medicine group so that individual medical histories can be updated to reflect actual exposures sampled.

HSS’ Office of Independent Oversight conducted a complete review of the WTS Emergency Management Program in 2007. The review identified the Hazards Survey and Emergency Planning Hazards Assessments as a significant weakness, and the other programmatic areas (Program Plans and Procedures; Training, Drills, and Exercises; and Contractor Feedback and Improvement) as Needs Improvement. The assessment noted a significant decline in the quality of the WTS Emergency Management Program since the previous assessment in 2002. For the past 2 years, WTS has been working on correcting the findings from the 2007 assessment, including reorganizing the Emergency Management Function, replacing the responsible manager, updating the hazards surveys, improving program procedures, training additional personnel, obtaining and using new software, and conducting effective drills and full participation exercises. Corrective actions have been documented, including documented assessments in the closure files, and submitted to the Carlsbad Field Office for review and acceptance. In addition, WTS has been working closely with EM Headquarters to ensure acceptability of the corrective actions. Although this VPP assessment did not look specifically into many of the details of the Emergency Management Program, it was clear from the response to the accident during the assessment that the site is capable of quickly establishing communications with emergency response personnel, coordinating that response with the local authorities, and ensuring the appropriate managers are quickly and appropriately involved in the process. The emergency response team personnel responding to the accident did so with great professionalism and courtesy, and with the highest regard for proper patient care. The availability of emergency personnel onsite around-the-clock is commendable. In addition, WTS has received several awards for their Mine Rescue Team, which is possibly one of the best trained teams in the country.

WTS has its preventive maintenance program performed and operated by the onsite maintenance services. The maintenance organization has responsibility for all preventive and corrective

maintenance. The WTS work control group recently made some changes to improve how action requests (work requests) are processed and prioritized and to minimize maintenance-related delays in day-to-day activities. This change was a result of self-identified weaknesses related to operational delays that resulted from preventive and corrective maintenance activities that were not incorporated into day-to-day operations. In addition, WTS identified that many action requests that were postponed or given low priorities were often “lost” in the system and never revisited. Due to this weakness, many low priority actions have not been addressed for nearly 3 years. The new process incorporates the action request review process in the plan-of-the-day morning meeting. By doing this, the action requests are reviewed by members of safety, maintenance, operations, and transportation/receiving. The prioritization of the order is designated at this point as well. Additionally, WTS work control has compiled a list of “lost” action requests (action requests never added to the work control system for completion) and is reviewing all of them for prioritization in the new system.

The current backlog for corrective maintenance and preventive maintenance is approximately 1,250 work orders, representing approximately 3 months total work effort and is consistent with established WTS goals for backlog. However, due to past action requests that were not entered into the work control system due to low priority, that backlog may rise significantly due to the ongoing review of “lost” action requests. WTS uses CHAMPS to process and plan work orders. CHAMPS does not contain a resource loaded scheduling function, so WTS is currently upgrading to the P6 Primavera System. This new system will allow the scheduled action requests to be integrated with operations and transportation activities so that managers can review all activities on a daily basis for operational and resource impacts. Because the systems are in the process of being implemented their effectiveness cannot be evaluated at this time; however, the fact the systems are being implemented based on self-identified weaknesses suggests the changes will be effective in addressing the issues identified.

WTS is in the process of implementing a new DSA for its Contact- and Remote-Handling activities. The previous/existing DSA incorporated many of NMED permit requirements into the DSA itself. As a result, any changes to the existing DSA, including Level 1 Procedures essential to the performance of Waste-Handling activities, required not only TSR and DSA changes, but approval from NMED. This requirement resulted in excessive turnaround times for procedure changes. In order to deal with this excessive turnaround time, WTS permitted managers and supervisors to work around the system by using standing work orders and exemptions until procedures could be revised. This practice resulted in tension between the managers and the operators tasked to perform their work to these procedures, contributing to workers’ perceptions of “production over safety” (this issue is further discussed in the Management Leadership section). This problem was identified by the Expert Review Team and is being addressed as part of WTS Conduct of Operations improvements. The new DSA does not include the environmental-permitting requirements and will also reflect some of the lessons learned from performing these activities for the past 10 years. The NMED Hazardous Waste Permit will remain in effect, and those requirements will have to be reviewed when changes occur, but the process will be more streamlined.

Due to the age of the WIPP facility and the recent efforts to extend its mission, WTS has initiated several new programs to extend the facilities reliability. The first initiative is to generate a life cycle extension program. This program will identify essential functions that are at, or beyond, their life expectancy so they can be budgeted for replacements/upgrades or put on a rigorous preventive/predictive maintenance program to extend reliability and anticipate repairs.

As a result of the life cycle extension review, WTS intends to identify systems and components whose continued operation is essential to safe production beyond their intended life cycle. Those systems will be further reviewed for and monitored in the System Health Program. For each system, WTS will assign a cognizant engineer responsible for that system who will ensure the system's continued operational reliability.

WTS also intends to reinstitute its predictive maintenance program for identified essential systems. WIPP had a predictive maintenance program in the past, but discontinued it in anticipation of a limited mission as a pilot plant. Given the recent changes suggested for its continued operation, WTS recognizes the need for a strong program to extend equipment life.

During the course of WTS' Expert Review and the VPP Gap Analysis, several interviews described symptoms of "production over safety" concerns. While neither of the reports gave specific details of proof of this issue, the consistency of the interviews supporting this issue's basis resulted in both reports highlighting this as a perception to be addressed by WTS. During the VPP review, the Team did find at least one case where a supervisor attempted to achieve safe production, but failed to properly analyze the hazards involved or implement the appropriate controls. Specifically, it was determined that waste-handling operators were resetting a tripped breaker in the HERE machine 480V panel rather than request electrician support to perform the task. Based on personnel interviews and a CHAMPS action request work package, it was determined that a first line supervisor in the Remote-Handling Group did submit an action request that maintenance perform an analysis (one time only) to confirm zero residual energy existed in the 480 volt panel of the HERE machine. When interviewed, workers who performed this check explained that the work request was performed to assure waste-handling workers that no residual energy was contained in the 480 V panel after the external mechanical breaker was switched off. The final result was that waste-handling operators believed they were "assured" that opening the 480V panel and resetting the breaker could be performed every time the breaker tripped without a potential electrical hazard present. This assumption, based on the action requests information failed to properly analyze the true hazards presented when accessing the 480V panel to reset the breaker. The failure was in the assumption that the external mechanical breaker would function properly when shut off and no energy would transfer to the panel as a result. The basis of the electrical safety procedure is that zero energy checks are only valid at the time the checks are confirmed (as is standard practice for any electrician performing panel work). As a result of the failure to recognize this hazard and properly analyze it, the supervisor incorrectly assumed zero energy in that panel, potentially endangering his workers when subsequently directing them to reset that breaker rather than request qualified electricians to perform the task. When this information was presented to WTS management, they confirmed the facts were correct and informed the workers involved that zero energy checks are valid only at the time of the check and are not to enter the 480V panel unless qualified to do so.

The majority of the WTS employees are Rad Worker II trained and are issued Thermo-Luminescent 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 specific level one procedures and with Radiological Control technician support involved. For example, at the remote-handling bay, the Radiological Control technicians were observed routinely surveying waste and the shipping casks throughout the performance of the procedure by waste handling.

Conclusion

WTS 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. Therefore, WTS has met 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 that they are capable of acting in accordance with management expectations and approved procedures.

The training of employees was reviewed by examining the training courses, attending selected training classes, and employee interviews. All WTS employees and subcontractor employees receive the General Employee Training for site access. WTS and subcontractor employees also receive HAZWOPER and Radiological Worker I and II training if their work requires it.

During the review, the Team observed a portion of the General Employee Training for new hires. The course information observed adequately covered the safety and health information a new employee would be expected to know. However, very little time or information was given to clearly explain the differences between ISMS and VPP. At the end of the course, all employees should understand that WTS' DOE-VPP Star status is the recognition of an exemplary safety and health program and record that exceeds the basic requirements.

Opportunity for Improvement: WTS should revise the General Employee Training to ensure newly hired personnel adequately understand the relationship between ISM and VPP, the relationship of the five tenets of VPP, and their personal role in maintaining DOE-VPP Star status.

Managers, supervisors, bargaining unit and exempt employees demonstrated that they understand the policies, rules, and procedures established to prevent exposure to hazards. Sufficient safety and health training is given to ensure that responsibilities are understood, that personnel recognize hazards they may encounter, and that they are capable of acting in accordance with management expectations and approved procedures. In response to observations by the VPP Gap Analysis team, WTS has revised and improved the training for managers, supervisors, and potential candidates for those positions. The course is a 2-day session that focuses on Leadership, and is intended to address some of the cultural issues identified in both the VPP Gap Analysis and the Expert Review Team. The course is led by a very experienced person with an extensive background in Human Resources, and includes a variety of materials that are presented in an engaging way. Currently, 40 people have already completed this training course with approximately 60 more still expected to complete the course by year's end.

The Team attended a training session on the new TSRs for WIPP. The TSRs have been revised to remove commitments to the NMED Hazardous Waste Permit that were embedded in the original Safety Basis documents. There appears to be fewer streamlined requirements that can facilitate implementation and application. The presentation by the trainer was informative and thorough. This was one of the first of many training sessions planned for implementation of the new DSA and TSRs at WIPP. The workforce was provided a training booklet to explain in more detail the aspects of the changes, and for future reference. The trainer was knowledgeable of the content and was able to answer most questions posed by the workforce.

The Mine Rescue Team is manned by volunteers who receive training beyond the required frequency. It is a valuable expert resource utilized by the surrounding community and State. WTS has two mine rescue teams, each consisting of eight WTS employee volunteers. Mine Rescue training is based on MSHA training and is provided monthly, which exceeds MSHA requirements. The team members are fully trained in first aid and Cardiopulmonary Resuscitation. The training includes hard line communications, gas sampling and some basic engineering to shore up areas. There are simulated exercises and competitions held on a regional basis where several States participate. The program is led by a highly experienced person who serves on the MSHA Rescue Training Board. A biweekly newsletter, "TRU Teamworks," is widely distributed with information about the Mine Rescue training. The WTS Mine Rescue Team has received numerous awards for its performance and training.

Training records are maintained in a technical training database, which also generates the 90-day, 60-day, and 24-hour reminders to employees, supervisors, and departmental training coordinators for training or refresher training, which the employee must take. E-mail notifications are sent to the employee, training coordinator, and the supervisor. If the employee fails to take the required training, the supervisor is notified by the system so he/she can ensure the employee maintains his qualifications. Per policy, failure to take the required training and supervisor's reminder may lead to disciplinary action, including termination, as well as denial of entry to the WIPP Site or other work area by Security. This process is intended to ensure that employees are always current on their training and refresher training requirements and any emerging issues or training requirements.

Site visitors and vendors are provided abbreviated site access training and are assigned to WTS coordinators to ensure that they follow WTS policies and procedures. Each subcontractor has a subcontractor technical representative (STR) who coordinates the vendor activities and is responsible for ensuring that vendors follow the WTS policies and procedures. WTS *Procedure WP 04-AD3013, Underground Access Control, Section 1.0, Underground Access Requirements* mandates that WTS employees, subcontractors, temporary employees, and other visitors, who have a need to go underground (U/G) and are not U/G-qualified shall be escorted by qualified personnel. If the above referenced personnel are "regularly exposed" to hazards in the U/G, or if they are going to go U/G more than 5 days per year, they must attend hazard training in accordance with 30 C.F.R. Part 48. In case of visitors, the coordinators have the responsibility to ensure that the 5-day limit is enforced.

There was no positive control system observed by the Team at the mine entry point (brassing station) that confirmed workers' training was current, or that visitors and vendors had not exceeded the 5-day per year limit. Consequently, the system was dependent solely on the individual, supervisor, or STR to monitor an individual's status for mine entry. Individuals at the mine entry point (brassing station) had no way to verify that an individual entering the mine either had the appropriate training, or had not exceeded the 5-day per year restriction.

Opportunity for Improvement: WTS needs to develop a reliable and effective system to ensure the Mine Safety Procedures 5-day limit is enforceable to all non-40-hour mine safety trained individuals, accessing the mine.

Additional training is provided to the radiological control technicians, waste handlers and miners, and maintenance workers. The training consists of two parts. The first part is to study

books and manuals for the equipment, and the second part is to demonstrate the competence in handling of equipment, called “practicals.” The subject matter experts (SME) test the book and manual knowledge. Practical requirements require the newly hired or reassigned employees to learn the use of equipment from experienced employees who may or may not be the SMEs to whom the new worker must demonstrate his competence. Upon completion of both book knowledge and practicals, the employees receive their qualification cards. Performance of these practicals is dependent on the individual signing off the trainee’s qualification card. In many cases, newly hired or recently assigned radiological control technicians, miners, and waste handlers must find experienced workers to show them the “ropes” on their own. These experienced workers do not have any time allocated for training and are more likely to help a friend rather than an unknown new hire or reassigned worker who needs to learn how to use the equipment. Many workers expressed dissatisfaction with this process. The trainees and trainers expressed a preference for a previous practice where experienced workers served as mentors, and portions of the mentors schedule were dedicated to mentoring. Workers consistently expressed the opinion that practicals training was more thorough and took longer in previous years, but that current “production” pressure has led to the current practice of “catch as catch can” approach.

A similar approach is taken in the electrical and instrumentation areas/shops, but in those shops qualification signoffs were performed by dedicated SMEs. While the electrical training program materials covered the appropriate topics, the Team did observe one case where a qualified electrical worker did not follow the standard safety practices. In that case, an underground electrician was observed working in a 480-volt panel without donning the appropriately rated gloves per the WTS work permit.

Opportunity for Improvement: Clear standards for demonstration of proficiency in equipment operation should be established and maintained, such that proficiency is not determined based on individual preference or work schedules. Individuals specified to “signoff” on qualification cards should be given training on application of those standards to ensure uniform application.

Conclusion

Safety and health training continues to be a top priority at WTS. Part of each supervisor’s performance evaluation is achievement of ontime training for each employee under his/her supervision. The identification of various required training courses is rigorous and on target to meet legal and performance standards. The courses are effective in building safety performance and implementing a culture of safety.

VIII. CONCLUSIONS

Since the 2005 Recertification, WTS has been subjected to increasing production pressures. It has responded to those production pressures, for the most part, by increasing the pace of operations and tried to maintain their focus on safe, compliant operations. In some cases, however, those production pressures have resulted in some decisions that appear to some workers as detrimental to workers. These decisions, however well-intentioned by managers and supervisors at the time, have contributed to perceptions by some workers that the safety culture at WIPP has deteriorated. All personnel contacted by the Team clearly demonstrated their desire for safe, compliant operations, but breakdowns in communications across the organization were hindering it from making real improvements. The structure of annual performance awards in past years has contributed to reluctance on the part of workers to report accidents or injuries. There have been at least three events in the past 3 years where contributing causes have not been adequately addressed, primarily the JHA process, to identify and remove potential hazards. The accident that occurred during this triennial reassessment was still under investigation at the time of this assessment. The report of the Type B investigation was issued before this assessment report was finalized, and indicated that conditions observed by this Team, as well as previous internal and external assessments, contributed to the accident. Both managers and the workforce are committed to making improvements and changes to address the necessary cultural changes. The conduct of the Expert Review Team assessment and the VPP Gap Analysis last year was a clear example of WTS' desire to self-identify problems and make changes for the better, and WTS is to be commended for being open to both those highly self-critical reviews. WTS has made many changes in the past few months that the Team believes will have lasting influence on the culture, but those changes need the opportunity to mature and demonstrate their effectiveness in the long term. Consequently, the Team is recommending that WTS be permitted to continue as a participant in DOE-VPP at the Star level on the condition that WTS addresses the Opportunities for Improvement identified in this report, as well as those conditions and issues identified in the Expert Review Team and VPP Gap Analysis reports. The Team will revisit WTS in 12 months to measure progress and make a final determination regarding WTS' continued participation in DOE-VPP.

Appendix A**Onsite VPP Audit Team Roster****Management**

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