Los Alamos National Security, LLC
Los Alamos National Laboratory
Los Alamos, New Mexico

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
November 14-17, 2011

U.S. Department of Energy
Office of Health, Safety and Security
Office of Health and Safety
Office of Worker Safety and Health Assistance
Washington, DC 20585

Foreword

The Department of Energy (DOE) recognizes that true excellence can be encouraged and guided but not standardized. For this reason, on January 26, 1994, the Department initiated the DOE Voluntary Protection Program (VPP) to encourage and recognize excellence in occupational safety and health protection. This program closely parallels the Occupational Safety and Health Administration (OSHA) VPP. Since its creation by OSHA in 1982 and DOE in 1994, VPP has demonstrated that cooperative action among Government, industry, and labor can achieve excellence in worker safety and health. The Office of 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, employees, and DOE.

Requirements for DOE-VPP participation are based on comprehensive management systems with employees actively involved in assessing, preventing, and controlling the potential health and safety hazards at their sites. DOE-VPP is designed to apply to all contractors in the DOE complex and encompasses production facilities, laboratories, 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 participants 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 Merit or 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 employees 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.

This report summarizes the results from the evaluation of Los Alamos National Security, LLC, at the Los Alamos National Laboratory, Los Alamos, New Mexico, during the period of November 14-17, 2011, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding its participation in DOE-VPP.

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

AD	Associate Director
BBS	Behavior-Based Safety
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CMR	Chemistry, Metallurgy, and Radiological
DART	Days Away, Restricted, or Transferred
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
EAP	Employee Assistance Program
EOC	Emergency Operations Center
EDS	Employee Development System
ES&H	Environment, Safety and Health
ESH&Q	Environment, Safety, Health and Quality
FLM	First Line Managers
FRB	Fiberglass Reinforced Box
GL	Group Leader
HEPA	High Efficiency Particulate Air
HPI	Human Performance Improvement
HSS	Office of Health, Safety and Security
IH	Industrial Hygiene
IWD	Integrated Work Document
IWM	Integrated Work Management
IWSST	Integrated Worker Safety and Security Team
JHA	Job Hazard Analysis
KSL	KSL Services Joint Venture
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LASO	Los Alamos Site Office
MDA-B	Material Disposal Area B
MOV	Management Observation and Verification
MRB	Management Review Board
MSS	Maintenance and Site Services Division
NAICS	North American Industry Classification System
NNSA	National Nuclear Security Administration
OSHA	Occupational Safety and Health Administration
PAD	Principal Associate Director
PPE	Personal Protective Equipment
RCT	Radiation Control Technician
SMART	Specific, Measurable, Achievable, Relevant, and Timeframed
SME	Subject Matter Expert
TA	Technical Area
Team	Office of Health, Safety and Security DOE-VPP Assessment Team
TRC	Total Recordable Case
UPS	United Parcel Service, Inc.
VPP	Voluntary Protection Program
WSST	Worker Safety and Security Team

EXECUTIVE SUMMARY

Los Alamos National Security, LLC (LANS), is a partnership among the University of California, the Babcock and Wilcox Company, Bechtel National, Inc., and URS Corporation. On December 21, 2005, LANS was awarded the contract to manage and operate the Los Alamos National Laboratory (LANL). Transition to the new contract was effective in June 2006. As part of its proposal, LANS established attaining Department of Energy (DOE) Voluntary Protection Program (VPP) Star status as a goal. In September 2009, LANS submitted its DOE-VPP application and the initial onsite assessment was conducted April 19-29, 2010. After that assessment, LANS was admitted to DOE-VPP at the Merit level. As a Merit participant, LANS is required to have an annual assessment to determine whether it is making progress toward Star level. This report documents the results of a progress assessment conducted November 14-17, 2011, and provides the Office of Health, Safety and Security DOE-VPP Assessment Team's (Team) recommendation to the Chief Health, Safety and Security Officer regarding that application.

Since the 2010 review, LANS accident and injury rates have been relatively flat. Some divisions have seen reductions in their rates. In particular, the Maintenance and Site Services Division has seen a 35 percent reduction. Those gains have been offset by increases in other divisions. Discussions with managers and workers indicated that the rise in rates in those divisions was more likely due to an increased willingness by workers to report an injury, and injuries that would previously have gone unreported are now being reported.

Discussions with LANS and the DOE Los Alamos Site Office led to agreement with the Team that the North American Industry Classification System Code 5417, *Scientific Research and Development Services*, was not an accurate characterization of the activities performed by LANS at Los Alamos. Per the DOE-VPP protocols, it was determined that a weighted comparison of three different codes based on work hours applicable to each of those codes was a better comparison. Using this revised approach, LANS is below the comparison statistic and meets the statistical expectations for DOE-VPP Star status.

Senior managers at LANL remain committed to achieving DOE-VPP Star status and are willing to provide workers with the tools and resources needed. That commitment is penetrating down through the middle managers and gaining acceptance by the workforce. Managers must be careful that their zeal for quick results does not disempower Worker Safety and Security Teams (WSST) or discourage workers from seeking alternative solutions to longstanding problems. Managers should continue looking for frequent and visible opportunities to interact with personnel and translate statements of commitment into palpable actions.

Employee involvement and participation in the LANS safety program is improving. Some groups have taken a much more active role than others. Considerable leadership focus remains targeted at improving worker involvement. WSSTs, the primary vehicle for direct employee involvement, have increased their visibility and level of activity and provide an excellent opportunity for the employees and the managers to work collaboratively to identify and resolve safety issues. Initiatives to implement Behavior-Based Safety and Human Performance Improvement approaches developed by LANS are maturing and gaining broader acceptance, but have not yet been adopted or accepted in all areas. To continue improvement, LANS should encourage use of these tools by all personnel across LANL.

LANS has completed modifications to the Integrated Work Management (IWM) process, but has not resolved the 2010 weakness of a systematic hazard analysis for work assumed to be low-hazard. Worksite inspections for safety and health hazards are improving through Management Observation and Verification. LANS needs to ensure a systematic, efficient approach is applied to analyze all hazards, including periodic worksite inspections that involve more than just deployed safety and health staff. LANS should also continue with current efforts to improve and streamline the IWM process.

LANS has completed or initiated a number of improvements to hazard controls across LANL. Efforts to encourage workers to continue identifying hazards and proposing solutions need time to mature and demonstrate sustainability and acceptance by the workforce.

LANS safety and health training and the associated qualification programs are generally effective and ensure that employees are appropriately trained to recognize hazards of work and the work environment and to protect themselves and their coworkers. Since the 2010 assessment, the training records have migrated into a more comprehensive database. LANS is improving many of its courses utilizing the "electronic blackboard" technique, which provides instant student feedback to the instructor.

Improvements made in the past 18 months are beginning to show results in worker involvement and participation, willingness of workers to identify and correct safety issues, and recognize that safety is a necessary component of mission success. LANS is making good progress and needs to continue those efforts to meet the expectations for Star status. The Team is recommending that LANS continue in DOE-VPP at the Merit level.

TABLE 1

OPPORTUNITIES FOR IMPROVEMENT

LANS needs to further modify the P-300 process to ensure that hazard level decisions are based on an analysis that identifies and documents the inherent assumptions in that decision and then use that determination as the basis for the level of additional work planning required.	**14**
LANS should take compensatory measures to ensure all workers have an updated Form 1793 and that the updated form is on file with the site medical personnel.	**19**

I. INTRODUCTION

Created in 1943 during the Manhattan Project, Los Alamos National Laboratory (LANL) was selected as the site to design and build the world's first nuclear weapons. Chosen for its isolation, limited access, and the ability to use the surrounding canyons for explosive tests, the site was an ideal location for this work. Since its inception, LANL had been managed by the University of California under contract to the U.S. Army, the Atomic Energy Commission, the Energy Research and Development Agency, the Department of Energy (DOE), and finally the National Nuclear Security Administration (NNSA). In order to gain greater efficiency in the operation of LANL, as well as address longstanding safety and security issues, NNSA opened competition for the LANL contract in 2003. Los Alamos National Security, LLC (LANS), a partnership, including the University of California, the Babcock and Wilcox Company, Bechtel National, Inc., and URS Corporation, was awarded the contract to manage and operate LANL and completed transition in June 2006.

LANL is spread over approximately 40 square miles and is divided into multiple technical areas (TA). TAs are grouped and managed by location and function. LANL is bordered by the Santa Fe National Forest, Bandelier National Monument, the San Ildefonso Pueblo, and the towns of White Rock and Los Alamos.

The primary mission of LANL is to develop and apply science and technology to ensure the safety, security, and reliability of the U.S. nuclear deterrent; reduce global threats; and solve other emerging national security challenges. For more than 60 years, LANL has served as a research center in the world of science, technology, and engineering and has made achievements that focus on safety, security, environmental stewardship, nuclear deterrence, threat reduction, operations, communications, and community involvement. Specialized capabilities at LANL provide our Nation with a reliable nuclear deterrence. Some of the capabilities include reliability and performance of LANL weapons systems and achieving NNSA's complex transformation for the Nation's nuclear weapons stockpile. Other capabilities include anticipating, countering and defeating global threats, and developing a secure energy future.

LANS is organized in a matrix structure. Four Principal Associate Directors (PAD) are assigned for Science Technology and Engineering, Weapons Programs, Global Security, and Operations and Business. These PADs are responsible for the primary missions of LANL. Each PAD has a number of Associate Directors (AD). These Directorates are further organized into Divisions and finally into groups. The PADs and ADs come from a variety of backgrounds that include longtime experience at national laboratories; other facility operations; maintenance and construction, both nuclear and nonnuclear; and environmental stewardship (including waste management and environmental restoration). Initially, maintenance at LANL was performed by a LANS subcontract to KSL Services Joint Venture (KSL), a joint venture between Kellogg Brown and Root, Inc., Shaw Infrastructure, Inc., and Los Alamos Technical Associates, Inc., who had been responsible for maintenance at LANL for many years. In December 2008, LANS decided to bring the maintenance effort in-house and subsequently hired most KSL workers directly.

As part of its winning proposal, LANS identified its commitment to achieving Star status in the DOE Voluntary Protection Program (VPP). Since it assumed management of LANL, LANS has actively pursued that commitment. In September 2009, LANS submitted its application for participation in DOE-VPP to the Los Alamos Site Office (LASO). LASO concurred with the

application and forwarded the application to the Office of Health, Safety and Security (HSS) in October 2009. An initial onsite assessment was conducted April 19-29, 2010, and LANS entered DOE-VPP at the Merit level.

LANL is the largest of the National Laboratories. Including subcontractors, there are approximately 14,000 people working at LANL on a daily basis. The personnel are a mix of PhDs, postdoctoral students, graduate and undergraduate students, technicians, engineers, crafts people, laborers, administrators, and support personnel. The site's maintenance and craft support is unionized with 13 separate unions, each of which signed a joint commitment letter endorsing its support for VPP at LANL.

Hazards at LANL run the gamut from routine hazards to those associated with operating Category II nuclear facilities. As such, workers can be exposed to standard industrial hazards, beryllium, nanoparticles, toxic and hazardous chemicals, radioactive materials, high-voltage electricity, confined spaces, explosives, high-energy particle beams, lasers, and a host of other hazards. Given the nature of research and development work at LANL, it is also very possible for workers to be exposed to hazards that are not yet recognized and fully understood.

As a Merit participant, LANS must be reviewed annually by the HSS DOE-VPP Assessment Team (Team) to evaluate progress toward Star status. This report documents the results of that review conducted November 14-17, 2011. The Team consisted of 11 people, including DOE Federal employees from DOE Headquarters and one from another DOE site office, and volunteer personnel from other DOE-VPP participating contractors. During the assessment, the Team visited many LANL facilities; conducted interviews with senior LANL managers, including the Laboratory Director, PADs, ADs, and Division Directors; observed work activities, including research, maintenance, and operations; reviewed revised policies and procedures and other documents; observed Worker Safety and Security Team (WSST) meetings, and had contact with many LANL personnel. This report documents the results of the Team's activities and provides the Team's recommendation to the Chief Health, Safety and Security Officer regarding LANS' continued participation in DOE-VPP.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Injury Incidence/Lost Workdays Case Rate (LANS)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Incidence Rate	DART* Cases	DART* Case Rate
2008	15,824,172	123	1.55	44	0.56
2009	17,124,172	169	1.97	67	0.78
2010	17,887,815	141	1.58	43	0.48
3-Year Total	50,836,159	433	1.70	154	0.61
Bureau of Labor Statistics (BLS-2010) combined average for NAICS** Code 5417, *Scientific Research and Development Services;* 5612, *Facilities Support Services;* and 5629, *Remediation and other Waste Management Services*.			2.36		1.15
Injury Incidence/Lost Workdays Case Rate (LANS Subcontractors and Vendors)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART* Cases	DART* Case Rate
2008	3,674,480	55	2.99	20	1.09
2009	1,906,280	26	2.73	18	1.89
2010	2,207,391	37	3.35	18	1.63
3-Year Total	7,788,151	118	3.03	56	1.44
Bureau of Labor Statistics (BLS-2010) average for NAICS** Code 5612, *Facilities Support Services*			3.6		1.9

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

TRC Incidence Rates, including subcontractors: 1.88
DART Case Rates, including subcontractors: 0.72

Since the 2010 review, LANS accident and injury rates have been relatively flat. Some divisions have seen reductions in their rates. In particular, the Maintenance and Site Services Division (MSS) has seen a 35 percent reduction. Those gains have been offset by increases in other divisions. Discussions with managers and workers indicated that the rise in rates in those divisions was more likely due to an increased awareness by workers of the need to report any injury, and injuries that were previously believed to be too minor to report are now being reported.

Discussions with LANS and DOE LASO led to agreement with the Team that the NAICS Code 5417, *Scientific Research and Development Services,* was not an accurate characterization of the activities performed by LANS at Los Alamos. It was determined that a weighted

comparison of three different codes based on work hours applicable to each of those codes was a better comparison. The weighted comparison is based on the number of hours worked in each of the three NAICS codes compared to the total hours worked. The DOE-VPP documents permit the use of an alternative comparison statistic where the NAICS code does not provide an accurate comparison. This comparison approach has been used in the past by other multiprogram national laboratories. Using this revised approach, LANS is below the comparison statistic. Use of this comparison statistic will now permit LANS to focus on other aspects of the safety program and reduce the emphasis on TRC and DART case rates.

III. MANAGEMENT LEADERSHIP

Management leadership is a key element of obtaining and sustaining an effective safety culture. The contractor must demonstrate senior-level management commitment to occupational safety and health, in general, and to meeting the requirements of DOE-VPP. Management systems for comprehensive planning must address health and safety requirements and initiatives. As with any other management system, authority and responsibility for employee health and safety must be integrated with the management system of the organization and must involve employees at all levels of the organization. Elements of that management system must include: (1) clearly communicated policies and goals; (2) clear definition and appropriate assignment of responsibility and authority; (3) adequate resources; (4) accountability for both managers and workers; and (5) finally, managers must be visible, accessible, and credible to employees.

Observations and interviews by the Team with managers clearly demonstrated the commitment of the senior management team to improve safety at LANL. Managers interviewed by the Team recognize the relationship between safety and the ability to perform the essential science mission in support of national security. That commitment begins with the Laboratory Director, who understands the need for strong worker and manager involvement and cooperation, and his well-publicized view that safety is part of the job, not an overlay. A new Laboratory Director was appointed in May 2011. As a previous PAD, he was already intimately familiar with LANL, but as the new Laboratory Director, he made a purposeful effort to engage with LANL workers through a series of workforce engagement meetings. These meetings were specifically intended to encourage LANL workers to express concerns and help identify solutions. The meetings consisted of the Laboratory Director asking only two questions: (1) what is working; and (2) what is not working? Two specific safety improvement efforts resulted from those meetings. A pressure safety working group was formed to standardize and improve the LANS approach to pressurized systems for LANL work and an effort to evaluate and integrate safety, security, and quality into the procurement process more efficiently. While those efforts have not yet been completed, they are expected to improve LANL operations and safety. The Laboratory Director is also challenging the entire LANL workforce to examine what they do and how they do it to look for opportunities to drive improvements in safety, security, quality, and mission.

The managers' presence in the workplace continues to be an evolving process at LANL. Most managers interviewed believe that manager visibility in the workplace is a positive influence. PADs still have difficulty scheduling time to visit facilities within their scope of responsibility, but ADs and division directors interviewed during this assessment were clearly engaging their workforce with positive results. Management Observation and Verifications (MOV) were still being used by managers. In some cases, managers were intentionally asking members of WSST to accompany them while performing MOVs as a means of mentoring and coaching WSST members and getting additional input from the WSST members regarding potential workplace concerns.

In some cases, primarily related to research activities, although first line managers (FLM) and group leaders (GL) strongly support the safety of their workers, they often believed that efforts to document project safety via job hazard analysis (JHA) and Integrated Work Documents (IWD) placed unnecessary cost burdens on their project. If these FLMs and GLs do not fundamentally believe the investment in documenting project safety contributes to the success of the project or mission, the effectiveness of efforts to improve those safety processes will be severely limited. This belief indicates that LANS needs to emphasize that the efforts to adequately analyze and

plan for project safety are essential to mission success, and associated costs must be included in the early stages of project planning to ensure sufficient resources are available to complete the work safely. It is vital for LANS to continue building support for systematic, rigorous safety programs at the mid-level manager and supervisory level in order to achieve the broader safety improvements necessary for DOE-VPP Star status.

Opportunity for Improvement: LANS needs to emphasize that efforts to adequately analyze and plan for project safety are essential to mission success at the mid-level manager and supervisory level.

In 2010, there was concern over distribution and assignment of limited subject matter expertise for safety and health. Industrial hygienists were concerned that they were unable to direct resources to some areas where they were required, and researchers felt the distribution of resources was not responsive to their needs. LANS is continuing to refine its deployment of subject matter expertise to give better alignment toward risks. Additionally, changes to the P-300 process to streamline the need for subject matter experts (SME) during the integrated work planning process have helped reduce some demands for SMEs. In general, personnel contacted by the Team during this review were satisfied that they had access to the appropriate experts when needed.

In a few cases, assignment of resources for programmatic and research activities can be further improved. For example, addition of multiple cranes was needed to expand the capacity for hot cell work within the Chemistry, Metallurgy, and Radiological (CMR) Laboratory. Budget resources were obtained, but inadequate planning related to environment, safety, health, and quality (ESH&Q) caused multiple work-stoppages and cost overruns resulting in only one new crane being installed. To ensure safety is not compromised due to inadequate resources, LANS should review the process for capital or large equipment installations to include ESH&Q planning during the design process and before final costs are established and budgeted. Costs for such improvements should be equitably distributed to future projects that will use the equipment.

Opportunity for Improvement: LANS should review the process for capital or large equipment installations to ensure ESH&Q is efficiently addressed during the design process and before final costs are established and budgeted and ensure costs for such improvements are equitably distributed to future projects that will use the equipment.

Managers have worked with their WSSTs to identify more specific goals using the SMART (Specific, Measurable, Achievable, Relevant, Timeframed) paradigm. Those goals were incorporated into organizational Safety Improvement Plans. LANS identified in its annual report that each directorate leadership should ensure the status of its goals and objectives is updated at least quarterly and shared with personnel, perhaps through their WSST committees. Observations during this assessment indicated that while the safety improvement plans and goals exist, they may need greater visibility. Many old posters remain throughout LANL spaces with older goals rather than being replaced with the new goals and objectives. Few people interviewed by the Team made reference to the goals indicating they may not be seen yet as adding value. LANS should continue looking for more effective ways to call attention to goals and celebrate achieving those goals.

Opportunity for Improvement: LANS should continue looking for more effective ways to call attention to goals and celebrate achieving those goals.

Some managers have done an excellent job of encouraging, empowering, and enabling the WSSTs within their scope of influence. Those managers were complimentary of the WSST efforts and clearly valued the WSST as an essential part in fostering improvements in safety. Other managers have been less successful. A variety of influences may be preventing greater participation on those WSSTs, including less visible manager communication with the WSST. Managers in some cases, in the interest of achieving quicker results, have given WSSTs direction and solutions, appointed membership and chairpersons, rather than empowering WSST members to identify their own solutions. Although it is not immediately apparent that direction is preventing greater enthusiasm and participation by the WSST, managers should consider using more coaching and encouragement to help WSSTs become more self-directed and improve results. Some examples of effective coaching and mentoring reported by managers and workers included: picking a WSST member to accompany managers on MOVs; asking WSSTs to address more complicated issues and propose solutions; providing WSSTs the resources to implement those solutions; inviting WSST members to attend management-level issue meetings; and ensuring managers recognize WSST participation as part of the job, not an additional or ancillary duty. Such approaches may take longer to achieve the desired short-term improvement, but will have longer term benefits.

Opportunity for Improvement: LANS managers should focus more on coaching and encouraging WSST members and leaders rather than directing them to help WSSTs become more self-directed and improve results.

LANS has expanded the availability and use of reward and recognition programs like the spot awards. In particular, the MSS Division has been particularly effective in recognizing and rewarding individual efforts and suggestions. The use of customized hardhats as a reward was seen by workers as an effective means of rewarding them for identifying issues and making suggestions. Similarly, spot awards were frequent and desired by managers and personnel in the Chemistry, Life, and Earth Sciences Division.

In 2010, LANS was having difficulty convincing some workers that identified improvements could not be made based on competing priorities for resources. Since that time, LANS has become more effective in discussing the status of safety improvements through WSST meetings and regular management meetings. Corrective actions are communicated down through WSSTs. In 2010, the Team recommended that LANS implement a centralized database to track WSST issues and actions across LANL. Since then, LANS has implemented a new tracking system, FootPrints, as a means of tracking issues and concerns. However, some confusion existed among managers and WSST members regarding the use of the FootPrints database. Some managers believed the system was only for tracking of LANL-wide issues, and some WSSTs were continuing to use their own localized systems in lieu of FootPrints. LANS should clarify its policy and conduct training to ensure a common understanding of FootPrints. Further, if FootPrints is not intended to be a system to track all WSST actions and issues, LANS should establish a common system for all WSSTs so WSST members can efficiently review issues being worked by other WSSTs and eliminate redundant efforts.

Opportunity for Improvement: LANS should clarify its policy and conduct training to ensure a common understanding of the FootPrints issue tracking database. Further, if FootPrints is not intended to be a system to track all WSST actions and issues, LANS should establish a common system for all WSSTs so WSST members can efficiently review issues being worked by other WSSTs and eliminate redundant efforts.

In 2010, the Team identified the cultural differences between highly educated research staff and highly experienced support staff as one of the challenges to be overcome. During this assessment, the Team was not as aware of the cultural differences leading to conflict. While a more cooperative atmosphere among craft, support, and research staff was evident, opportunities exist to continue communicating and reinforcing the necessity of a team approach between facility operations and programmatic personnel, SMEs, ESH&Q, other support staff, and scientists and engineers. Managers should clearly communicate a consistent message that operational excellence (integration of safety with excellent delivery on a wide range of LANL products) is a shared responsibility and essential for mission success. One area where this communication can be improved was observed at CMR. Specifically, the prioritization of work requests submitted by program personnel was not always communicated to the original work requestor. Weekly prioritization meetings and weekly Management Review Boards included programmatic personnel, but feedback to the original requester was inconsistent. Improving that feedback to the original requester may help clarify the contributions both research and facility support personnel make to work efforts and could raise awareness of the shared responsibility that is needed to achieve operational excellence.

Opportunity for Improvement: LANS managers should clearly communicate a consistent message that operational excellence (integration of safety with excellent delivery on a wide range of LANL products) is a shared responsibility.

In 2010, LANS had not yet demonstrated the capability to perform an annual assessment targeted at the five tenets of DOE-VPP. Since then, LANS has performed one annual assessment and was preparing to perform its second assessment at the time of this evaluation. The report submitted by LANS for 2010 effectively identified those areas where LANS needed to focus its efforts. The method used represents a systematic process to evaluate progress toward the criteria in the DOE-VPP documents.

In general, the 2010 assessment found that senior managers at LANS were clearly committed to achieving DOE-VPP Star status and were willing to provide workers with the tools and resources needed. While senior management was proactive, its commitment had not yet been fully shared at all levels of the organization. LANS managers needed to continue to reinforce their commitment through more effective communication across all levels at LANL, as well as continuing to increase manager visibility and presence in work areas. The need for managers throughout the organization to communicate more effectively across organizational boundaries remains. Improving the availability of open forums where managers and employees can collaborate, discuss continuing improvements, recognize and resolve issues, and learn from their experiences will accelerate the pace of change and gain broader acceptance for new approaches to safety.

Since 2010, there have been significant changes in senior managers, including a new Laboratory Director, a new Deputy Laboratory Director, three new PADs (two acting, one permanent as of this assessment), and a reorganization of capital projects and environmental programs. The new senior management team's commitment to improving safety at LANL continues to be clear, and manager reassignments have had a positive effect. The previous Deputy Laboratory Director was a strong champion for the WSSTs and the VPP effort. As of this assessment, the new Deputy Laboratory Director had not yet started, but has a strong history of support for VPP, and it is anticipated that the new Deputy will fill that champion role.

Conclusion

Senior managers at LANL remain committed to achieving DOE-VPP Star status and are willing to provide workers with the tools and resources needed. That commitment is beginning to penetrate down through the middle managers and gaining acceptance by the workforce. Managers must be careful that their commitment and zeal for quick results does not disempower WSSTs or discourage WSSTs from seeking alternative solutions to longstanding problems. Managers should continue looking for frequent and visible opportunities to interact with personnel, and translate statements of commitment into palpable actions. Given the size and scope of the LANS effort to achieve DOE-VPP Star status, LANS managers must ensure the desire for short-term success does not hinder the longer term improvement. LANS is making good progress toward meeting the expectations for DOE-VPP Star in the Management Leadership tenet.

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 involvement is a major pillar of a strong safety culture. Employee participation is in addition to the individual right to notify appropriate managers of hazardous conditions and practices. Managers and employees must work together to establish an environment of trust where employees understand that their participation adds value, is crucial, and welcome. Managers must be proactive in recognizing, encouraging, facilitating, and rewarding workers for their participation and contributions. Both employees and managers must communicate effectively and collaboratively participate in open forums to discuss continuing improvements, recognize and resolve issues, and learn from their experiences.

In 2010, the Team concluded that employee involvement and participation in the LANS safety program had not yet reached the level of consistency and maturity expected of a DOE-VPP Star participant. Some groups had taken a much more active role than others. Considerable leadership focus was targeted at improving worker involvement. WSSTs, the primary vehicle for direct employee involvement, had been established across LANL and provided an excellent opportunity for the employees and the managers to work collaboratively to identify and resolve safety issues. Since the initiation of the new contract, LANS had put in place a number of system improvements leading to improved safety and safety statistics. The challenge in 2010 was to motivate a diverse group of employees from researchers to crafts to internalize safety at every step of the process by adopting an uncompromising desire to want to "do it right, every time, all the time," and being mindful about everyday "at-risk" behaviors.

Eighteen months later, LANS has made significant progress in expanding employee involvement. WSSTs remain the primary means of fostering employee involvement, although success of those teams varies. All WSSTs are using regular rotation of team members. The stated rotation goal is approximately every 2 years. This is having the effect of expanding LANL populations with experience serving on a WSST, and is certainly raising employee awareness of the WSST purpose and activities. The process for selection of team members varies, depending on the individual management culture of the organization the WSST represents. In some cases, members of the WSST are strictly volunteers, approved by their managers. In other cases, members are selected by a manager from a pool of volunteers, and in the remaining cases, members are asked by managers to volunteer. While the selection method does not necessarily determine the effectiveness of the WSST, organizations that have not had great success gaining volunteers to serve on the WSST should more closely evaluate those factors that may be hindering the ability to obtain volunteers. The organizations that are most successful in obtaining volunteers consistently consider service on the WSST as an essential element of organizational success, challenge the WSST to address hard problems and identify creative solutions, mentor and coach WSST leaders, and involve WSST members in accident and injury investigations and MOVs. Those organizations establish an atmosphere that demonstrates the manager's support for, and valuation of, the WSST members and their contributions.

LANS may have missed an opportunity to fully engage the WSSTs in addressing the opportunities for improvement identified in the 2010 DOE-VPP report. The teams were provided the report, but were not expected to take a fundamental role in addressing the opportunities for improvement. The WSSTs should revisit that report and critically evaluate whether conditions observed and discussed remain salient and work to identify creative methods

to address those conditions. WSSTs should also be given a leadership role in addressing the opportunities for improvement identified in this current assessment report. Where actions have been taken, WSSTs should evaluate whether those actions were truly effective or if opportunities exist to improve on them. Such an approach will give WSSTs the opportunity to challenge the status quo and create successes that will build confidence and enthusiasm within WSSTs.

Opportunity for Improvement: The WSSTs should revisit the 2010 report and critically evaluate whether conditions observed and discussed in that report remain salient and work to identify creative methods to address those conditions. Where actions have been taken, the WSSTs should evaluate whether those actions were truly effective or if opportunities exist to improve on them. WSSTs should also be given a leadership role in addressing the opportunities for improvement identified in this current assessment report.

WSSTs have taken actions that improve their visibility. The Integrated Worker Safety and Security Team (IWSST) Web page has links that allow any employee to identify their WSST representative. Safety campaigns, such as free vehicle inspections, have also been used as a means for employees to get to know their WSST members. After the Los Conchas fire in June, the IWSST organized a "WSST Fest." That fire caused the evacuation of LANL, as well as the town of Los Alamos. As part of the return to work and restart process, the IWSST and WSSTs set up booths for "Get to Know Your IWSST/WSST members" and arranged for the Employee Assistance Program (EAP) personnel to be available to talk to employees about any stress, apprehension, or other issues being felt as a result of the evacuation or any other life event.

In addition to WSSTs, employees also participate in other safety committees. Examples included a Worker Safety Committee, a Criticality Safety Committee, a Glove Box Safety Committee, and Radiation Safety Committee. Many members of these other safety committees also serve on WSSTs.

An essential aspect of worker involvement is the right and willingness of workers to stop or pause work when there is a question about their ability to perform the work safely. As in 2010, nearly all workers interviewed by the Team were aware of their right to stop work. During a meeting with the union stewards, the representatives agreed that there has been significant improvement since the last assessment regarding response to raising safety concerns or stopping work.

The ability of WSSTs to share and compare issues and solutions remains challenging. LANS has not yet fully implemented a common and consistent approach for WSSTs to identify, track, and resolve issues and share that information between WSSTs. The integrated project plan identified the FootPrints database as a means for accomplishing this objective, and that database is being used for some issues, but it has not yet gained wide acceptance by all WSSTs; and as discussed in Management Leadership, confusion exists regarding the database's role and use.

In 2010, the Team observed that LANS had successfully addressed a number of safety improvements by setting appropriate expectations and implementing effective policies, procedures, and safety rules, but safety performance had reached a plateau. It was the 2010 Team's view that the next step in safety improvement was related to behavioral and cultural elements and required a different strategic approach. In response, LANS has tried to expand use and acceptance of tools that affect workers' behavior and mindset, such as the Atomics

Behavior-Based Safety (BBS) program, and implementation of Human Performance Improvement (HPI) initiatives, with some success. Use of these tools has not yet gained broad acceptance across LANL although some divisions have seen marked changes in worker behaviors. LANS should find ways to share the success stories across divisional lines regarding these tools. LANS should work to integrate HPI techniques into the integrated work planning process. Finally, LANS should challenge WSSTs to evaluate all accidents, injuries, near-misses, or safety issues within the HPI framework to help identify latent institutional or cultural weaknesses and then identify and implement solutions to address those latent weaknesses.

Opportunity for Improvement: LANS should find ways to share BBS and HPI success stories across divisional lines, work to integrate HPI techniques into the integrated work planning process, and challenge WSSTs to evaluate all accidents, injuries, near-misses, or safety issues within the HPI framework to help identify latent institutional or cultural weaknesses and then identify and implement solutions to address those latent weaknesses.

Conclusion

Employee involvement and participation in the LANS safety program is improving. Some groups have taken a much more active role than others. Considerable leadership focus remains targeted at improving worker involvement. WSSTs, the primary vehicle for direct employee involvement, have increased their visibility and level of activity and provide an excellent opportunity for the employees and the managers to work collaboratively to identify and resolve safety issues. LANS is continuing to work on motivating a diverse group of employees from researchers to crafts to internalize safety at every step of the process by adopting an uncompromising desire to want to "do it right, every time, all the time," and being mindful about everyday "at-risk" behaviors. Initiatives to implement BBS and HPI approaches are maturing and gaining acceptance in certain areas, but still need greater acceptance across LANL. LANS is clearly progressing toward the expectations of a DOE-VPP Star participant in the Employee Involvement tenet.

V. WORKSITE ANALYSIS

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

Since the 2010 review of LANS, the core of the work planning and control process remains the Integrated Work Management (IWM) process defined in the IWM procedure, P-300. This process produces an IWD, which is intended to be a worker-friendly document that describes the work activity, identifies the hazards, and links them to specific controls. LANS revised the P-300 process since the 2010 review. Those changes have not altered the fundamental process of integrating the five core functions of Integrated Safety Management.

LANS continues to face a number of challenges related to worksite analysis. Because the changes to P-300 were not issued until October 2011, events over the previous 18 months show that the changes to P-300 have not yet matured to show marked improvement in identifying, analyzing, and developing effective controls for all hazards. While more time is required to validate improvements in IWM, several assessments that incorporated IWM noted significant improvements in the areas of research and development and programmatic work. These assessments included participation from LASO, DOE-HSS, and the Defense Nuclear Facilities Safety Board (DNFSB) staff. There is still a need for additional improvements in conduct of operations and hazard analysis in isolated areas where weaknesses exist. A review of the Occurrence Reporting and Processing System database shows there were approximately 20 hazardous energy/lock-out/tag-out issues; 10 radiological events; and 10 events relating to unplanned chemical exposures or mishaps. Many of these reportable events identified a lack of hazard communication and analysis that led or contributed to the event. Although the frequency of these events may seem small in relation to the population of LANL, some of the weaknesses that continue to contribute to events were not addressed in recent changes to the P-300 process. In the 2010 review, the process flow for IWM defined in P-300 contained a graded approach to work planning based on the planners' assumption of the hazards associated with the work. Work identified as low or routine required no further planning or documentation. This approach, while understandable in its intent, did not document the inherent assumptions or any analysis that led to a low-hazard determination and limited systematic inclusion of lessons learned associated with routine, low-hazard work. DOE's expectation for VPP participants at the Star level continues to be that *all hazards* are analyzed, including low-hazard activities. Changes to the P-300 process since 2010 did not include assurance that some form of hazard analysis is documented to justify a decision that work is low-hazard and capture the assumptions and limits to that work. LANS needs to further modify the P-300 process to ensure that hazard level decisions are based on an analysis that identifies and documents the inherent assumptions in that decision, and then use that determination as the basis for the level of additional work planning required.

Opportunity for Improvement: LANS needs to further modify the P-300 process to ensure that hazard level decisions are based on an analysis that identifies and documents the inherent assumptions in that decision and then use that determination as the basis for the level of additional work planning required.

In November 2011, LANS issued a handbook for performing hazard analysis. The handbook is a compendium of methods to evaluate hazards. LANS personnel participating in the hazard analysis process are expected to refer to the handbook in conjunction with IWM tools to assist in the analysis of hazards. The handbook provides practical examples relating to areas such as research and development, operations, and maintenance. The scope of the handbook applies to moderate and high-hazard activities. While the handbook clearly recognizes that most hazard analysis techniques can be applied to low-hazard activities, low-hazard activities are omitted from this document's scope. Despite the specific exclusion of low-hazard activities, the handbook is expected to provide useful information and techniques to personnel; and with additional training and experience, it will help fill the existing gap between hazard identification and hazard controls.

In 2010, LANS identified slips, trips, and falls as the largest contributor to work-related injuries. LANS tried numerous approaches to reduce these injuries with little success. As part of the effort to analyze and reduce these injuries, LANS discovered that United Parcel Service, Inc. (UPS), implemented a unique solution to reduce slips, trips, and falls. UPS developed a "Slip Simulator" and trained drivers to walk on slippery surfaces. LANS visited the UPS simulator and then built a similar simulator. As of this assessment, LANS has trained approximately 1,700 people, conducted presentations on the slip simulator at Voluntary Protection Program Participants' Association conferences, and provided briefings to other DOE-VPP participants. Personnel that have completed the simulator training report having their awareness of slippery surfaces raised significantly, and none of the people trained have suffered an injury due to slipping or falling. LANS continues to train personnel on a voluntary basis.

Since the 2010 assessment, MSS is performing extensive data mining to isolate where and how injuries are occurring in MSS. The resulting information has been used to develop several awareness campaigns and has been effective in addressing those identified vulnerabilities. For example, MSS has mandated a prework stretch and flex program in response to strain and sprain injury illness increases. The MSS Glove Policy was initiated as an awareness campaign in response to a trend for increasing hand injuries last year. The glove policy was effective because the safety group did not merely mandate glove use, but developed a three-page policy that described in detail the types of gloves that should be used for specific tasks. The document included photos of the type of glove recommended for each task that was available in the MSS warehouse. Finally, MSS publishes a weekly safety bulletin that incorporates recent experiences in injury and illnesses. Participation from the various environment, safety and health (ES&H) managers has been effective in providing current topics for the publications.

During this review it was evident that managers are becoming increasingly involved in the hazard identification, analysis, and control selection. The Team identified several instances where the MOV process, which included managers and WSST members, had some management participation in supporting workers with the control selection/correction process. In some cases, management walkthroughs on the programmatic side are being announced ahead of time. While

this provides motivation for general housekeeping, it limits observations of 'normal' conditions and can limit identification of hazards and suboptimal work procedures. In other cases, programmatic staff does not believe a manager higher than an FLM has conducted a walkthrough in their space; managers should be encouraged to inform staff of their presence during, but not prior to, the walkthrough.

At CMR, the ESH&Q manager has developed and is implementing a title 10, Code of Federal Regulations, part 851, (10 CFR 851), inspection/surveillance schedule. Examples of topics covered, or to be covered, in fiscal year 2012 include Ladder Inspections, Combustible Inspections, Hood Testing, Eyewash Inspections, Nontechnical Safety Requirement Fire Suppression Component Inspection, and Glove Box Inspections. In addition to the 10 CFR 851 surveillance, this facility also employs monthly safety-related management self-assessments, which include Forklifts/Powered Industrial Trucks, ChemLog Review, Confined Space Program Review, Bloodborne Pathogens Program Review, Nonionizing Radiation Program Review, Lock-out/Tag-out, Program Review, Respiratory Protection Program Review, Heat Stress Program Review, Asbestos Program Review, Indoor Air Quality, and Office Safety Inspections. Management assessments are scheduled and performed and are cross-referenced to institutional assessments to ensure appropriate coordination. CMR managers also hold weekly Management Review Boards (MRB) to review completion of open facility issues/in-house findings. The MRB discusses status of each near-term or overdue issue and determines if the current schedule is viable or if the completion plan requires revision. The results of this meeting are fed into the weekly prioritization meeting to ensure weekly priorities incorporate required issue resolution. While these efforts are noteworthy, the opportunity to combine the best attributes of each of these surveillance programs processes should be considered after evaluation of successes and lessons learned.

LANS demonstrated its willingness to stop work when previously unexpected hazards are identified. In February 2011 during the cleanup of TA-21, Material Disposal Area B (MDA-B), suspect beryllium was discovered in one of the dig areas. As soon as the workers uncovered the jars of the suspect metal, the excavation was halted and the enclosure operation was shut down. All workers were protected from any exposure as all were wearing level B Personal Protective Equipment (PPE), including supplied air respiratory protection. The Industrial Hygiene (IH) personnel entered the enclosure on supplied air and took samples. The excavation in that enclosure remained on hold until the sample results were received. The sample results confirmed the metal was beryllium. The discovery required the implementation of the beryllium standard and LANL's beryllium program including enrolling all employees working in that enclosure, into the beryllium medical surveillance. As evidenced by this incident, the hazard for beryllium was analyzed and planned for, and the employees were protected from exposure.

Conclusion

In 2010, the Team concluded that LANS had multiple tools available for personnel to identify and analyze hazards. These tools and processes were evolving. For the moderate and high-hazard activities, hazards analysis processes were becoming more structured. As of this assessment, LANS has completed modifications to the IWM process, but has not resolved the 2010 weakness of a systematic hazard analysis for work assumed to be low-hazard. The success of these improvements will be demonstrated and measured by a reduction in perceived low-hazard events entered into the DOE database. Worksite inspections for safety and health hazards are improving through MOVs. In order to achieve Star status, LANS needs to ensure a

systematic, efficient approach is applied to analyze all hazards, including periodic worksite inspections that involve more than just deployed safety and health staff. LANS should also continue with current efforts to improve and streamline the IWM process.

VI. HAZARD PREVENTION AND CONTROL

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

As described in the Worksite Analysis section and identified in prior LANS self-assessments and DOE reports, LANS continues to face several challenges related to controlling hazards at LANL, particularly in its high hazard nuclear facilities. Occurrences and events over the preceding 18 months continue to demonstrate weaknesses in the LANS process to consistently identify, analyze, and establish controls to protect the worker. The number of events relating to hazardous energy exposures should provide impetus for LANS to critically examine the current processes and evaluate the effectiveness of those processes throughout LANL. Notwithstanding those challenges, LANS has demonstrated improvement within the five tenets of VPP during the past 18 months.

Throughout the review, the Team observed the hierarchy of controls being used. Several good examples of engineered controls to replace administrative or procedural controls were noted by the Team. For example, LANL personnel had developed a habit of crossing Diamond Avenue, one of the major roads crossing TA-3, at any convenient location, usually outside crosswalks due to limited parking availability. LANS upgraded sidewalks and installed fencing along Diamond Avenue to direct personnel onto the crosswalks. In another example, in 2010, personnel in the welders' training shop would open the shop bay doors and use fans to promote proper circulation of the air during welding operations. IH sampling of the individual workstations indicated that method did not ensure adequate worker protection. MSS installed a multi-trunk line, high efficiency particulate air (HEPA) filtration ventilation system in the welder training shop to ensure adequate worker protection at the welders' workstations. Finally, CMR Waste Management personnel determined it was possible to substitute an ST-90 waste box lid with one that was 200 pounds lighter. This lid is only used when collecting waste in the box and allows workers to open or move the box within the facility. The standard lid is replaced on the box prior to shipment.

The Weapons Division has made several improvements to its facilities since 2010 that has not only improved safety, but improved worker effectiveness. For example, at the Vessel Repair Facility where vessels used in the Dual Axis Radiographic Hydrodynamic Test facility are cleaned and repaired, personnel designed and installed a motor-driven, gimbaled stand that allows 360-degree rotation of the vessel to facilitate removal of incomplete combustion byproducts, cleaning, and horizontal surface welding repairs. This group also acquired and installed a HEPA-filtered Perma-con® modular structure that connects to the vessel to contain and isolate byproduct materials and contaminants. In another example, personnel in the Weapons Division had experienced several slip injuries when leaving their cell phones in outside lockboxes. To prevent those injuries, the Weapons Division has modified its cell phone policy to ensure the appropriate explosive safety and security requirements are met, but not expose personnel to additional risk. The Weapons Division has also consolidated its Firing Point access control process to improve accountability and efficiency without putting personnel at additional risk.

Since 2010, MSS has implemented several actions to improve the quality of IWDs used for maintenance. The efforts are intended to ensure that the work instructions are clearer and more useful to the worker. To that end, LANS developed a training program for the planners preparing work packages for TA-55 and MSS that emphasized incorporating HPI principles in work package development. The training emphasized a more "workable" document encouraging the use of action words and reducing boiler plate language that was not associated with the work being performed. MSS also developed and updated the MSS IWD Writers Guide to ensure institutional processes for preparing maintenance IWDs are captured and consistent for IWD preparers. As changes and improvements are made to the IWD process, the Guide is updated.

Another improvement initiated by the work control managers was removal of duplicative "boiler plate" hazard controls from IWDs. To address this problem, MSS established the MSS Maintenance Worker Qualification Program. That program establishes training and qualification requirements for workers to ensure they understand the low-hazard activities and the necessary controls associated with the "boiler plate" controls typically listed in the IWDs.

MSS is currently developing an "expedited" work process for work tasks determined to be low-hazard activities capable of being performed based on training and skill of the craft. In support of that effort, MSS has developed a comprehensive MSS JHA Manual as an optional tool for planners and supervisors to consult and use to assist preparing the workers performing the low-hazard work. The manual is a collection of approved JHAs created at LANL for low-hazard work activities. The manual consists of more than 300 JHAs linked by an alphabetized directory that allows for easy retrieval of the required JHA.

MSS is currently piloting a reverse prejob briefing process to improve the quality of the prejob briefs. The new process is based on a program developed by the Institute for Nuclear Power Operations with the expectation to greatly improve worker involvement in the prejob planning process. In a typical prejob briefing, a supervisor will read the contents of the team's work package to them highlighting the potential hazards and remedial controls in place. Workers are offered the opportunity to ask questions or raise concerns based on that briefing prior to the start of work. However, the effectiveness of the prejob is dependent upon the level of interaction between the supervisor and the workers. The reverse prejob utilizes an approach that is designed to increase the effectiveness of that interaction. The workers are given time to review the work package prior to the prejob, and during the prejob they are asked questions regarding the hazards present: what are the controls; what would be considered "at risk behaviors" for this task, etc. By using this process the workers are more engaged and, therefore, better prepared for the work task.

In the environmental cleanup and waste management efforts in the TA-54 Box Line, operators designed an improved dolly for transporting Fiberglass Reinforced Boxes (FRB) from the entry ramp to the containment for repackaging. As the old dolly went over the raised floor, it would turn unevenly and cause the pallet of waste drums to slide off the dolly. The new design allowed for the pallet to roll over the concrete without turning. As an extra precaution, they procured banding material to band the FRBs to the dolly. Waste drums are now moved more safely and with less chance of tipping.

All of these promising initiatives reflect the VPP expectation to pursue continuous improvement beyond compliance. In the 18 months since the 2010 review, MSS has reduced its TRC and DART case rates by approximately 35 percent in that 18-month period.

Team observations of weapons program and research personnel indicated that the IWD process has experienced improvements in those fields as well. The streamlining of the P-300 requirements and the more efficient deployment of safety and health personnel has resulted in increased satisfaction with the IWD process. Some exceptions noted were primarily concerned with the length of time SMEs used in processing the necessary paperwork supporting the IWDs, but overall, satisfaction with the process is improving.

The safety and health staff at LANL is comprised of individuals with varying degrees of experience, education, and certification. Qualified resources that are available onsite include qualified Fire Protection Engineers, Associate Safety Professionals, Certified Safety Professionals, Certified Industrial Hygienists, Radiological Control Technicians, Certified Professional Ergonomists, and a fully staffed Occupational Medical Department. These functions are bounded by developed roles, responsibilities, authority, and accountabilities. The staff serves various organizations from both an embedded and deployed model.

During the previous review, several observations by the Team indicated that the level of staffing may not be sufficient to adequately support day-to-day activities and maintain the programmatic elements of the ES&H systems. LANS responded to this concern and has made efforts to improve the deployment of safety and health expertise to increase their availability. Streamlining efforts with the P-300 process has also contributed to improving the availability of resources (see Management Section for more details).

The Occupational Medicine program at LANL resides under the Associate Director for ESH&Q. The Occupational Medicine Division clinic is located in TA-3 in Building 1411. The Occupational Medicine Division is staffed with two licensed physicians (there are also two physician vacancies, including the Medical Director position), one nurse practitioner, four physicians' assistants, four full-time nurses, three part-time nurses, two EAP counselors, four psychologists, a wellness coordinator, an epidemiologist, and worker compensation staffers.

As discussed in the 2010 review, the evaluation of task/work/environment, enrollment, and removal from medical monitoring programs and ongoing monitoring of potential work hazards using the Form 1793 was a well-intentioned process that had not been effectively implemented. LANS initially intended to integrate the Form 1793 review into the annual performance evaluation process to address the problem. That effort has been delayed by a subsequent decision to completely redesign the performance evaluation process. Until the new performance evaluation process is implemented, LANS should take compensatory measures to ensure all workers have an updated Form 1793 and that the updated form is on file with the site medical personnel.

Opportunity for Improvement: LANS should take compensatory measures to ensure all workers have an updated Form 1793 and that the updated form is on file with the site medical personnel.

On June 26, 2011, the Las Conchas wildfires began in the Jemez Mountains approximately 12 miles southwest of LANL. Because of the potential threat to LANL, a LANL closure was announced and the LANL Emergency Management declared the fire as a nonemergency significant event and activated the Emergency Operations Center (EOC). As a result of the fire

event, LANS had an excellent opportunity to test its emergency response and to evaluate its effectiveness and identify opportunities for improvement. Those opportunities for improvement and the noteworthy practices were captured and discussed in the *June 27, 2011 Fire on Los Alamos National Laboratory Property Resulting from the Las Conchas Wildfire* report. One of the noteworthy results identified was the fact that improvements made as a result of the Cerro Grande fire in May 2000 were effective. Several more opportunities for improvement have now been identified from the Los Conchas fire. Specifically, EOC infrastructure issues were identified, including communications issues with radio tower vulnerability to fire, competition for offsite cellular resources during the event, the need for an improved management of communication technologies, and improved training and qualification for EOC personnel.

Conclusion

LANS has completed or initiated a number of improvements to hazard controls across LANL. These efforts need time to mature and demonstrate effectiveness and acceptance by the workforce to meet the requirements of the Hazard Prevention and Control tenet. LANS continues to make progress toward DOE-VPP Star status.

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.

LANS had just completed leadership training for 300 managers when the 2010 assessment was conducted. As a part of this training, the attendees had received the "First Line Manager Tool Kit," a quick reference guide to many of the services, programs, and resources available at LANL. During this assessment, several FLMs indicated that the training had been helpful and were especially complimentary of the "tool kit." It provides a broad overview of functions, contacts for Emergency Operations Division, the Industrial Hygiene and Safety Division, the Occupational Medicine Division, Integrated Safety Management System, Fitness-for-Duty Program, EAP, and VPP. The managers stated that they have found it a handy resource both as a hardcopy and on the LANS ES&H Web site.

LANS has a program called the "New Manager On-Ramp" to identify and groom employees who have shown potential to become managers. Since May 1, 2011, all LANL management positions have required demonstration of management experience or endorsement through the On-Ramp Program. The 1-day assessment is comprised of a series of exercises that help determine a participant's readiness for a management position. Assessment elements include communication, influence, professional maturity, and execution. The individual and group scenarios place participants in the role of a manager and measure how well they engage, partner with, and influence others to resolve work-related issues. On-Ramp is being shepherded by the LANS' Deputy Human Resources Director and has support of the Laboratory Director. Originally piloted at TA-55 where 55 managerial positions were filled using this approach, the program was endorsed in late 2010, by the LANS Senior Executive Team to identify and select managers. Since its start in May 2011, LANS has conducted 38 sessions with 800 potential candidates for management positions. About 400 of the applicants were endorsed by the assessors.

LANS has an employee development program called the Los Alamos National Laboratory Protégé/Mentor program. The primary purpose of the program is to focus on aspects of mentoring, such as career goal setting, building business acumen, developing professional savvy, networking, fostering visibility, navigating LANL culture, and balancing work/life concerns. While the protégé is not guaranteed a promotion, it helps new employees, such as college graduates joining the LANL workforce, to improve in personal development and learn managerial and technical skills from their mentors to position themselves more effectively for advancement. The program, started just a few months ago, has not yet produced any measurable results so far, but should be evaluated in the future. The Team's conversations with the Training Manager indicated that he has a protégé who has the potential to become a manager in the foreseeable future.

Review of technical documents, courses, and interviews shows that managers and supervisors at the site continue to participate in some form of formal training or workshop discussions regarding their safety and health responsibilities at least annually. The Team interviews demonstrated that the managers and supervisors were able to adequately describe those

responsibilities. Based on technical information reviewed and the evidence collected during interviews, the LANS program of training managers and supervisors continues to be effective.

A review of training documentation and interviews with employees indicated that training continues to be carried out in a thorough and systematic manner. The antiquated Employee Development System (EDS) database has been replaced by a more comprehensive "Plateau" database, called "UTrain." The employees, managers, and the training staff were highly complementary of UTrain due to improvements in accessing the employee training records. UTrain permits the employees, the managers (both organizational and functional), and the training coordinators easy access to the employee training records.

Unlike EDS, wherein e-mail messages were sent by the training coordinators who performed monthly queries to identify employees whose training was coming due within the next 60 days or who were already delinquent, UTrain sends e-mail messages to the employees and their managers 60 days in advance of expiration; then 10 days in advance of expiration, and finally, at the expiration of the training. One of the weaknesses identified by the 2010 Team was that the functional managers of the deployed employees did not have access to the employees training records and, therefore, could not verify their qualifications for assigned tasks. The functional managers can now access the training records in UTrain to determine if the deployed employees are current in their required training. Furthermore, UTrain is scheduled to be upgraded on January 1, 2012, to notify the functional managers of the training status of all deployed workers daily via e-mail.

All new employees, subcontractors, and visitors for 10 or more workdays during any consecutive 12-month period continue to be required to complete the General Employee Training. Most of the courses require a passing score of 80 percent. Many of the courses have a "test out" option. The "test out" option partially addresses the opportunity for improvement identified by the 2010 Team that the short-term researchers with considerable scientific training were being required to spend too much time in training. LANS should continue working to identify test out options for all courses where individuals experience or education warrants that option and reduce required training time for individuals who already understand the material.

Eighteen months ago, the Team identified the need to institute some method of verification that attendees have met the learning objectives and can apply the lessons in practice. Potential approaches included the use of audience-polling technology in the classroom to determine whether attendees understand a set of concepts by instantly responding to questions posed by the instructor. LANS is piloting the use of an electronic blackboard system in six courses. The system was suggested by a graduate student intern based on his experience. The system employs "clickers" that provide instantaneous answers from the students. Now called "Learning Tree" by LANS, the system provides realtime feedback to the instructor on the effectiveness of the training. Students completing these courses have provided feedback that they tended to stay alert, learned better, liked the anonymous nature of clickers allowing them to answer where they might not have otherwise, and that the class was more fun and interactive. Almost all of the attendees stated that they would like to see more use of clickers. LANS is planning to expand the use of this system to most of the courses provided.

Conclusion

LANS safety and health training and the associated qualification programs are generally effective and ensure that employees are appropriately trained to recognize hazards of work and the work environment and to protect themselves and their coworkers. Since the 2010 assessment, the training records have been migrated to the more comprehensive UTrain (Plateau) Database. LANS is spearheading the Learning Tree system for many of its courses utilizing the "electronic blackboard" technique, which provides instant student feedback to the instructor. These developments demonstrate LANS' pursuit of excellence in safety and health training. LANS meets the requirements of the Safety and Health Training tenet of DOE-VPP at the Star level.

VIII. CONCLUSIONS

Through major changes in LANL leadership, senior managers remain committed to achieving DOE-VPP Star status and are willing to provide workers with the tools and resources needed. They have improved their visibility and understanding of the benefits of the VPP pursuit. Many organizations have been successful in fostering additional employee participation and involvement, and are setting a good example for cooperation between managers, workers, and other LANL organizations. In some cases, managers' zeal to achieve faster results may be detracting from the workers motivation to contribute. Many WSSTs are generally functioning very well. LANS has been successful in engaging some of its scientific community. Changes in the work management process for research are generally seen as positive changes, but need time to mature and gain broad acceptance.

Although LANS has made significant changes to the work management process, it has not altered its approach for work perceived as low-hazard or routine. The structure of IWM process continues to bypass systematic hazard analysis for work assumed to be low-hazard. Some efforts to perform and capture analysis for routine work within a worker's skill have been attempted within the MSS division, but those improvements have not yet been captured in the work management procedures and are not mirrored in other divisions' efforts.

Some improvements in hazard controls based on employee suggestions were evident across LANL. Efforts by WSSTs and managers to increase visibility, improve worksite inspections, and address workers' concerns in a timely manner are beginning to show positive results. LANS needs to continue these efforts to demonstrate the long-term commitment and sustainability of the efforts.

Safety performance statistics (TRC and DART case rates) meet the expectations for DOE-VPP Star status now that an alternative, more realistic comparison statistic has been established. Overall, statistics have been relatively stable over the past 3 years. Some divisions have seen significant reduction in injury and illness rates, while others have seen a rise. Workers and managers alike attribute those increases to a greater awareness of the need to report even minor injuries, and that they are now reporting injuries that would have previously been believed to be too minor for concern. LANS has made progress in addressing slips, trips, and falls through use of the slip simulator training. LANS needs to continue with current efforts to demonstrate long-term reduction in injury rates.

Overall, LANS is making good progress in improving the safety culture at LANL. As such, the Team is recommending that LANS continue participating in DOE-VPP at the Merit level.

Appendix A

Onsite VPP Audit Team Roster

Management

Glenn S. Podonsky
Chief Health, Safety and Security Officer
Office of Health, Safety and Security

William A. Eckroade
Principal Deputy Chief for Mission Support Operations
Office of Health, Safety and Security

Patricia R. Worthington, PhD
Director
Office of Health and Safety
Office of Health, Safety and Security

Bradley K. Davy
Director
Office of Worker Safety and Health Assistance
Office of Health and Safety

Review Team

Name	Affiliation/Phone	Project/Review Element
Bradley K. Davy	DOE/HSS (301) 903-2473	Team Lead, Management Leadership
Ali H. Ghovanlou	DOE/HSS	Management Leadership
John A. Locklair	DOE/HSS	TA-55, Worksite Analysis, Hazard Prevention and Control
Michael S. Gilroy	DOE/HSS	Hazard Prevention and Control, Worksite Analysis, Facilities Operations, Maintenance, Construction
Steve K. Singal	DOE/HSS	Safety Training
Carol S. Henning	DOE/Idaho Operations Office	CMR
Lynn Sant	Energy Solutions Federal Services	Environmental Restoration and Waste Management
Fred J. Brockman	Battelle, Pacific Northwest National Laboratory	TA-3, CMR
Curtis Reece	Battelle Energy Alliance, Idaho National Laboratory	Worker Safety and Security Teams, Employee Involvement
Melanie E. Gibson	Savannah River Remediation, LLC/SRS	Environmental Restoration and Waste Management
Francis A. Renk	National Security Technologies, LLC/Nevada National Security Site	S-Site, TA-16