National Security Technologies, LLC/Los Alamos Operations

Report from the Department of Energy
Voluntary Protection Program
Onsite Review
November 14-16, 2011

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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 implementation by 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. 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 available 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 National Security Technologies, LLC/Los Alamos Operations during the period of November 14-16, 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.

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ABBREVIATIONS AND ACRONYMS

BLS	Bureau of Labor Statistics
DART	Days Away, Restricted, or Transferred
DOE	Department of Energy
ES&H	Environment, Safety, and Health
FMS	Facility Maintenance Services
HHE	Health Hazard Evaluation
HSS	Office of Health, Safety and Security
IH	Industrial Hygiene
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LAO	Los Alamos Operations
LAST	Los Alamos Safety Team
NSTec	National Security Technologies, LLC
NAICS	North American Industry Classification System
NNSA	National Nuclear Security Administration
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
Team	HSS DOE-VPP Team
TPOC	Training Point of Contact
TRC	Total Recordable Case
VPP	Voluntary Protection Program

EXECUTIVE SUMMARY

National Security Technologies, LLC (NSTec), was formed in 2005 as a joint venture between Northrop Grumman Corporation (managing partner), AECOM, CH2M HILL, and Nuclear Fuel Services. Headquartered in Las Vegas, Nevada, NSTec manages operations at the Nevada National Security Site and has satellite operations across the country, including NSTec/Los Alamos Operations (NSTec/LAO) located just outside the city limits of Los Alamos, New Mexico. This facility consists of three levels, occupying approximately 41,489 square feet of usable area. The lower level houses shipping and receiving, maintenance shop, machine shop, pulsed x-ray laboratory, and storage facilities. The main level, or entrance to the facility, has approximately 50 percent office space and the remainder contains laser, holographic, camera development, radiography, electronics assembly, radiometry, and fiber optic workspaces. The upper level houses mainly office space with only a few laboratories. The Department of Energy (DOE) National Nuclear Security Administration Nevada Site Office provides oversight of and direction to NSTec/LAO.

Efforts to achieve DOE Voluntary Protection Program (VPP) Star status by NSTec/LAO began in 2007 and its application was received by the DOE Office of Health, Safety and Security (HSS) in 2011. Approval of an applicant for participation in DOE-VPP requires an onsite review by the HSS DOE-VPP team (Team). The purpose of this report is to document the results of the Team's review and provide the Chief Health, Safety and Security Officer with the necessary information to make the final decision about NSTec/LAO's participation in DOE-VPP.

The expectation for Star status is not perfection, but does include having an excellent safety record, and having managers and workers who are actively dedicated to and effectively pursuing continuous improvement and excellence in safety performance. At the time of this evaluation, NSTec/LAO employed 80 employees and subcontractors. Based on discussions and interviews with over 50 percent of the workers, supervisors, and managers, as well as extensive observation of field activities, inspection of worksites and facilities within the project scope, and review of records, the Team determined that NSTec/LAO has established a culture of safety excellence, is committed to continuous improvement, and has safety and health programs in place which are sufficiently mature and fully meet the tenets of DOE-VPP. Accordingly, the Team recommends that NSTec/LAO be approved for entry into DOE-VPP at the Star level. However, the Team has identified a few opportunities for improvement, which reflect those areas where NSTec/LAO can further improve its performance (see Table 1). While no formal action plan is required to address those opportunities, NSTec/LAO is expected to consider and specifically address them in its annual VPP status reports.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
The NSTec/LAO Senior Manager should visit all workspaces on a more frequent basis than once a month. This should be separate from periodic inspections.	5
NSTec/LAO should expand the walkdowns to identify potential hazards and encourage employees to be vigilant in everyday activities so hazards can be identified and corrected.	9
NSTec/LAO should review existing operations with the new hazard analysis process, focusing on hazards associated with the facility or equipment being used, and ensuring that the logical alignment between the identified hazards and selected controls are justified and captured.	9

I. INTRODUCTION

The Department of Energy (DOE) Voluntary Protection Program (VPP) onsite review of National Security Technologies, LLC (NSTec)/Los Alamos Operations (LAO) in Los Alamos, New Mexico, was conducted November 14-16, 2011.

NSTec was formed in 2005 as a joint venture between Northrop Grumman Corporation (managing partner), AECOM, CH2M HILL, and Nuclear Fuel Services. Headquartered in Las Vegas, Nevada, NSTec manages operations at the Nevada National Security Site and has satellite operations across the country, including NSTec/LAO. NSTec/LAO is housed in a leased facility just outside the city limits of Los Alamos, New Mexico. The facility consists of three levels which occupy approximately 41,489 square feet of usable area. Approximately 60 percent of the facility is office space with the remainder used for laboratories. NSTec/LAO provides engineering, applied science, software development and data analysis, diagnostic development, and instrumentation support to the Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory, Sandia National Laboratories, and the National Nuclear Security Administration (NNSA). NNSA's Nevada Site Office provides oversight of and direction to NSTec/LAO.

Recognition in DOE-VPP requires an onsite review by the Office of Health, Safety and Security DOE-VPP Team (Team) to determine whether the applicant is performing at a level deserving DOE-VPP Star recognition. During the site visit, the Team observed activities, evaluated relevant safety documents and procedures, and conducted interviews to assess the strength and effectiveness of NSTec/LAO's health and safety programs.

The Team had contact with approximately 50 percent of the approximately 80-person workforce, including managers, laboratory scientists, engineers, technicians, maintenance, and office personnel. Activities included observation of preventive and corrective maintenance activities, briefings, walkdowns of shop areas, review of documents (such as procedures and job hazard analyses (JHA)), and conducted both formal and informal interviews with workers and managers. Hazards encountered by NSTec/LAO workers include lasers, high voltage, radiation-generating devices, standard office hazards (e.g., ergonomic hazards, office equipment, parking lots), as well as hazards associated with analytical laboratory work.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Table 2.1 Injury Incidence/Lost Workdays Case Rate (NSTec/LAO)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Rate	Days Away, Restricted, Transferred (DART) Cases	DART Case Rate
2007	154,409	0	0	0	0
2008	147,652	2	2.7	1	1.4
2009	122,516	0	0	0	0
2010	125,165	2	3.2	1	1.4
Best 3 Years	425,811	2	0.9	0.3	0.46
Bureau of Labor Statistics (BLS-2010) average for *NAICS Code # 541712 (Research and Development in Physical, Engineering, and Life Sciences (except Biotechnology))			1.5		0.6

Table 2.2 Injury Incidence/Lost Workdays Case Rate (Subcontractor)					
Calendar Year	Hours Worked	TRC	TRC Incidence Rate	DART Cases	DART Case Rate
2008	494	0	0.00	0	0.00
2009	740	0	0.00	0	0.00
2010	860	0	0.00	0	0.00
3-Year Total	2094	0	0.00	0	0.00
Bureau of Labor Statistics (BLS-2010) average for NAICS Code # 541712 (Research and Development in Physical, Engineering, and Life Sciences (except Biotechnology))			0		0.00

* North American Industry Classification System

TRC Incidence Rates, including subcontractors: 0.9
DART Rates, including subcontractors: 0.46

Conclusion

DOE-VPP is adopting the Occupational Safety and Health Administration (OSHA) requirements for Star and Merit contained in appendix A of the OSHA Instruction, *CSP 03-01-002*, that provides for an alternative calculation for eligible smaller worksites to use the best 3 of the most recent 4 years of data. This method helps reduce the statistical effect of single injuries on sites with a small workforce and helps reduce the dependence on accident and injury statistics to prevent underreporting of injuries. Revisions to the DOE-VPP programmatic documents in 2011

now contain the alternative calculations for small sites consistent with OSHA appendix A. NSTec/LAO, consistent with OSHA and DOE-VPP programmatic guidance for industries with less than 200,000 hours worked per year, utilizes the best 3 out of 4 years injury rates to compute the averages and incidence rates. For calendar year 2011, NSTec/LAO has had no reportable injuries. NSTec/LAO's accident and injury rates meet the expectations for a DOE-VPP Star participant.

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) managers must be visible, accessible, and credible to employees.

NSTec/LAO employs approximately 80 people. It is headed by the Senior Manager who reports to the Director of Stockpile Stewardship headquartered in Las Vegas, Nevada. The NSTec/LAO organizational structure is composed of five sections: Administration and Facilities; Radiographic Systems; Electro-Optics; Diagnostic Instrumentation; and Physics and Analysis. The managers are degreed, experimental scientists while others are highly experienced technicians. They have experience in operating sophisticated equipment used to perform diagnostic tests. The entire management team is very involved in ensuring that work performed at NSTec/LAO is conducted safely. Since the working population at NSTec/LAO is relatively small, there is almost a family atmosphere at the site. Interviews with these managers indicated that the subject of safety is taken very seriously in all aspects of the work performed at NSTec/LAO. The Senior Manager has chosen to be briefed on all procedural changes on new as well as ongoing projects. He personally signs approval documents for work to be conducted at NSTec/LAO to maintain his awareness of activities at NSTec/LAO. He and his direct reports participate in building walkdowns and are active in the correction of any deficiencies identified. The entire management team exhibits a high expectation for housekeeping that is reflected in the workspaces the Team visited. All areas were very orderly and uncluttered. The managers recognize that the investment in safe operation has reaped dividends with the workforce and encouraged worker participation in continuous improvement.

The NSTec corporate safety policy states: “We do work safely. Workers have a personal responsibility for their safety and the safety of those working around them. This fundamental safety responsibility cannot be delegated.” The management team reinforces the responsibility for safety throughout the organization with appropriate policies and procedures. The Senior Manager has established an open-door policy that encourages workers to communicate directly with him or via the safety committee. Interviews with the workforce clearly indicated that they understand and support the Senior Manager’s vision and policies.

The Senior Manager supports rewarding the workers for desired safe behaviors and encourages new ideas and solutions to safety issues. This is evidenced by two NSTec/LAO personnel receiving Fiscal Year 2011 Defense and Experimentation Stockpile Stewardship Safety Awards from the parent Company. The two employees received approximately $350 each for safety program participation. Also, two other NSTec/LAO employees were recognized for suggestions

that were implemented by the company. One suggestion was related to procurement improvements, and the other was related to installation of hand sanitizers.

While recognizing the high level of involvement by the Senior Manager, workers nonetheless commented to the Team that they would like to see the Senior Manager in their workspaces more often. The workforce sees their respective section managers on a daily basis. The Senior Manager indicated that he only gets out to the workspaces about once a month for scheduled walkdowns. Additional presence by the Senior Manager in the workspaces will further improve communications with the workers and demonstrate commitment to safety excellence.

Opportunity for Improvement: The NSTec/LAO Senior Manager should visit all workspaces on a more frequent basis than once a month. This should be separate from periodic inspections.

Conclusion

NSTec/LAO managers continue to effectively support and lead the workforce in improving the safety culture. The management team leads by example and is directly involved with the safe operation of the facility on a daily basis. They are clearly committed to the continuous improvement and excellence that are hallmarks of DOE-VPP participation at the Star level.

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 right of an individual 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 is crucial, and welcome. Managers must be proactive in recognizing, encouraging, facilitating, and rewarding workers for their participation and contribution. Both employees and managers must communicate effectively and participate collaboratively in open forums to discuss continuing improvements to recognize and resolve issues and to learn from their experiences.

The NSTec Los Alamos Safety Team (LAST) is the safety committee for NSTec/LAO. The committee consists of one volunteer from each of the five sections. The members typically serve for 1 year, but can serve longer. The committee has four officers who serve for 6 months: Chair, Vice-Chair, Recording Secretary, and Publication Secretary.

LAST members participate in monthly walkdowns of the work areas. The problems and issues identified during walkdowns are generally resolved quickly and discussed in the LAST meetings. For example, in August 2011, an employee identified speeding through the parking lot as a safety problem. The speeders were not NSTec/LAO employees, but employees from another company utilizing the parking lot as a through street. Within 2 weeks of the identification of the issue, NSTec/LAO closed the East entrance to its parking lot so that it was no longer a through street.

Employees are authorized to stop any work that they believe to be an unsafe act. NSTec procedure CCD-3200.006, *Stop Work*, applies to work performed by the employee, work performed by other employees, and work performed by subcontractors. In all Team interviews, the employees indicated that they not only had the right, but also the responsibility, to stop work if they felt a potential hazard or unsafe condition was present. Moreover, none felt that they would be subject to retribution or punishment if work was stopped. NSTec/LAO has also developed an informal process called "Time-Out" that allows employees to step back, take a fresh look at the situation, and resolve the concern before resorting to the more formal “Stop Work.” Employees are provided cards that are attached to their badge holders that serve as reminders of pertinent safety information. The badge explains “Time-Out,” including the examples of when it can be used. The reverse side of the same card explains “Stop Work” rights and responsibilities. Several employees referred to the card during interviews and work observations. Some employees stated that they found the cards useful and handy.

Employees were quite enthusiastic about safety in their interviews and felt that they receive excellent safety and health training. They understood that the Integrated Safety Management System (ISMS) is required by DOE in the contract and that VPP expectations go beyond ISMS, including enhanced employee involvement and extensive management commitment. Most workers stated that they felt safe in the workplace, that the Company wanted to send

them home safely after a day's work, and that they were their coworkers' keeper when it came to safety.

NSTec/LAO recognizes its major injury vulnerabilities are soft tissue injuries. NSTec/LAO is attempting to be proactive in the prevention of these types of injuries. For example, a newly hired employee with just 3 months on the job described how a safety professional had personally visited her several times to make sure that her workstation was ergonomically suitable. This was especially important to her since she had suffered ergonomic issues and injuries prior to starting work at NSTec/LAO. The safety professional ensured that a thorough ergonomic evaluation of her workstation was conducted soon after she began employment with the Company. NSTec/LAO provided ergonomically suitable furniture, computer screen placement, and an ergonomic keyboard and mouse. Other technicians reported similar experiences. Additionally, the safety professional had visited nearly every employee interviewed by the Team to ensure that ergonomic evaluation was routinely done when an employee moved to a new office or workstation. Employees stated that they would seek help from the safety professional if they had any safety or health issues.

Conclusion

Safety is deeply rooted in NSTec/LAO employees. Management has empowered employees to take ownership of their workplace and provided them with opportunities to fully participate in its pursuit of safety excellence. The employees and managers are working together to follow ISMS and VPP principles. Many practices, such as LAST, safety walkdowns, and ergonomic evaluations of all workstations, are promoting workplace safety. NSTec/LAO meets the Employee Involvement requirements of DOE-VPP at the Star level.

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.

NSTec/LAO baseline exposure assessments are maintained in accordance with the corporate guidance for documenting and tracking hazards in the workplace. NSTec corporate industrial hygiene (IH) professionals perform periodic Health Hazard Evaluations (HHE) at all NSTec satellite facilities, including LAO, per the corporate NSTec procedure OP-P280-005, *Industrial Hygiene Health Hazard Evaluations, Assessments, and Report*s. The Team had previously reviewed this process during the review of the NSTec corporate office in Las Vegas in 2010. During this evaluation, the Team reviewed the corporate procedures' application and content relative to NSTec/LAO. Recent HHEs reviewed by the Team were consistent with the direction provided in OP-P280-005. HHE areas that are evaluated by corporate NSTec include general occupational health and industrial hygiene, noise, respiratory protection, carcinogens, confined space, laser safety, Hantavirus prevention and control, asbestos, and lead control. One recent HHE reviewed by the Team identified elevated lead levels in the pulsed X-ray laboratory where lead bricks are used for shielding. The bricks are coated to minimize lead contamination. NSTec corporate has established thresholds for housekeeping. The corporate philosophy is to preclude lead contamination such that an airborne lead inhalation hazard is prevented. The area in the laboratory was cleaned and resampled with no detectable levels for lead. Similarly, areas where lead soldering occurs are sampled for lead. Employees interviewed indicated that frequent sampling is performed during HHEs, and they have a high degree of confidence that the hazards are being addressed.

NSTec/LAO has approximately 20 active work packages that address operations within the facility. These cover minor maintenance and laboratory operations. The 2010 DOE-VPP assessment of the NSTec corporate office reviewed the corporate hazard analysis process, which includes JHAs, and suggestions to address weaknesses in the hazard analysis process. The corporate office has recently revised the process to capture the rationale for control selection in the JHAs, but that has not yet been disseminated to the satellite facilities. Discussions with NSTec corporate safety and health contacts indicated that dissemination of the revised hazard analysis procedure to satellite and corporate users was imminent. The hazard analysis procedure still in use does not capture the rationale for control selection. Most work packages reviewed are very task-specific and employ a step-by-step sequence. The work packages for operation of lasers, pulsed X-ray, and proton radiography at LANL that were reviewed by the Team were very thorough and contained appropriate hazard identification and controls.

Employees regularly participate in periodic walkdowns and inspections. In particular, one participant demonstrated how a new apparatus had been installed in the workspace to remove soldering fumes. However, as the employee pulled the articulated exhaust fan head down to demonstrate to the Team how it worked, it fell off its mounting bracket. The bracket in use was a "C" clamp type. The employee indicated that this was not the first time it had slipped off. Within minutes after notifying the maintenance supervisor, a different base was procured and the installation was modified to correct the less-than-adequate mounting bracket. This particular situation had not been identified in walkdowns nor previously identified by the employee as a hazard despite his familiarity with the condition. In one of the laser laboratories, the Team observed the space in front of a circuit breaker panel obstructed by material storage. These conditions indicate that in some cases personnel performing safety walkdowns are not being sufficiently critical to identify latent hazardous conditions. NSTec/LAO should expand the walkdowns to identify potential hazards and encourage employees to be vigilant in everyday activities so these hazards can be identified and corrected. Upon release of the new NSTec corporate hazard analysis process, NSTec/LAO should review existing operations, focusing on hazards associated with the facility or equipment being used, and ensuring that the logical alignment between the identified hazards and selected controls are justified and captured.

Opportunity for Improvement: NSTec/LAO should expand the walkdowns to identify potential hazards and encourage employees to be vigilant in everyday activities so hazards can be identified and corrected.

Opportunity for Improvement: NSTec/LAO should review existing operations with the new hazard analysis process, focusing on hazards associated with the facility or equipment being used, and ensuring that the logical alignment between the identified hazards and selected controls are justified and captured.

NSTec/LAO tracks and trends a variety of information. Data collected and analyzed include injury/illness cases (type, location, severity), inspection results (type, location, root cause), workers' issues, training (HAZWOPER, Cardio Pulmonary Resuscitation/Automated Electronic Defibrillator, Emergency Preparedness, etc.), first-aid cases, patient visits (both work-related and nonwork-related), return-to-work (both work-related and nonwork-related), and fitness for duty (both work-related and nonwork-related). Since NSTec/LAO is a small facility, any recordable injury has a major impact on TRC and DART case rates. As a result of its focus on ergonomic concerns, the soft tissue issues have declined according to the NSTec/LAO safety professional.

Conclusion

NSTec/LAO facilities contain a variety of hazards that are well understood by a mature workforce. Most of the work performed is within a laboratory environment with engineering controls and processes that are procedurally driven. Implementing the pending changes in the hazard analysis process will allow the analysis to be captured and documented. The next challenge for NSTec/LAO will be to ensure that the resulting hazard analysis is correct, complete, and justifies the identified controls. NSTec/LAO continues to improve and meets the DOE-VPP Worksite Analysis requirements at the Star level.

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 Personal Protective 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 and procedures must also be followed by everyone in the workplace to prevent, control the frequency of, and reduce the severity of, mishaps.

NSTec/LAO employs engineered controls as the primary method to limit employee exposure to laboratory hazards. The laboratory areas observed by the Team used engineered controls to minimize potential employee exposures. Since the most hazardous laboratories use lasers and X-rays, engineered interlocks are employed to prevent personnel from entering the laboratories during their operation. These interlocks were developed, tested, and installed by NSTec/LAO. Interlocks are operated by employees in accordance with OP-AA30.001, *LAO Engineering Process*. NSTec/LAO employees explained the interlock operation for the Team and demonstrated the power interruption to the laser devices if the door was opened during its operation. These devices are required by laboratory procedure to be tested by laboratory personnel prior to operation of the lasers. In addition to engineered controls, administrative controls include training, adherence to safety rules, and very detailed procedures for operation of equipment.

The PPE used by the laser laboratories is state of the art. They have procured newer, clear-lens goggles that do not inhibit visual acuity in the laboratory, but provide the same or higher level of eye protection against direct or reflected exposure. In the X-ray laboratories, the use of thermoluminescent dosimeters, survey meters, and area monitors was observed. There is no radioactive material at NSTec/LAO, thus the only risk of radiation exposure comes from the X-ray generating devices. Other PPE observed included arc flash protection (all panels had arc flash calculations and warnings posted for use by qualified maintenance personnel), face shields, electro-mechanical gloves, goggles, aprons, hearing protection, and safety glasses.

NSTec/LAO has a robust emergency management program that details the hazards and response actions for the leased facility. Every year, company industrial hygienists from NSTec, Las Vegas, perform an annual hazard assessment to evaluate existing hazards or proposed work that may introduce new hazards into the facility. Evacuation and shelter-in-place drills are performed at the facility, and the Team was informed of emergency response actions during the initial briefing.

In addition to emergency management professionals, NSTec/LAO has “reach back” access to corporate headquarters for assistance in all disciplines, such as radiological professionals that periodically evaluate the X-ray laboratories and IH experts that periodically perform HHE evaluations. An onsite Certified Safety Professional is the primary facilitator for safety issues and contacts.

Facility Maintenance Services (FMS) is onsite and provides immediate response to issues. The facility uses external contractors for heating, ventilation and air-conditioning, the elevator, and structural maintenance. Work that is determined to be beyond the FMS skill set is performed by qualified subcontractors. All subcontractors must comply with NSTec/LAO safety programs.

The previous occupational medical contractor for NSTec/LAO was in Santa Fe, New Mexico, and had no direct knowledge of NStec/LAO activities. NSTec/LAO personnel had to drive to the Santa Fe occupational medical facility and wait to be seen. NSTec/LAO has since entered into an agreement with the Los Alamos National Security, LLC (LANS) occupational medical provider to support the needs of NSTec/LAO.

In addition to the improved arrangement with the LANS occupational medical provider, a LANS ergonomist provided ergonomic support to NSTec/LAO. This provided a local, highly qualified resource for evaluations for most of the NSTec/LAO facility. The ergonomist recently left LANS, and NSTec/LAO is searching for a replacement to perform those activities. The NSTec/LAO site safety professional is addressing ergonomic issues until a replacement can be identified.

Conclusion

Hazards at NSTec/LAO are well controlled. NSTec/LAO employs an appropriate range of engineered controls, administrative controls, and PPE to minimize its workers' exposure to hazards. Workers clearly demonstrated an ability to conduct work safely, and had an effective awareness of hazards. The NSTec/LAO occupational medical arrangement with LANS is an excellent example of work arrangements that benefit both the customer and support functions. NSTec/LAO meets the expectations of a Star participant in the DOE-VPP 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, personnel recognize hazards they may encounter, and they are capable of acting in accordance with managers' expectations and approved procedures.

The Team interviewed many employees whose experience ranged from 3 months to over 25 years at this facility. The employees indicated that their Environment, Safety, and Health (ES&H) training was adequate to recognize workplace hazards and take appropriate precautions. They felt that their training had provided them with appropriate tools to deal with the high-hazard work they perform, such as operating high-energy (Class IV) lasers. While the Team did not have the opportunity to observe any training (none was scheduled during the review period), it did review training records, course curricula, and reports showing training status of the employees. Employees have access to their own training records. Several employees actually demonstrated how they could access their training records, which are maintained in the training database called Plateau. The database showed the status of employee training, when refreshers were due, and when one could register for the upcoming training courses. Status of required training is an item on the agenda at the Operations Manager's, as well as the Section Managers', staff meetings. Neither of these meetings was scheduled during the review period for the Team to observe.

Currently, NSTec/LAO identifies trained and qualified workers in the work packages. The Team validated this approach by reviewing several work packages, such as AA3X-30, Rev 3, *Pulsed X-Ray Laboratory Operations, LAO*. The work package contains a *Master Skill of the Worker* section. This section in the work package mandates the training required for performing work in a particular laboratory and indicates when the training was completed. Each individual who works in that laboratory is required to successfully complete the mandatory training and the supervisor ensures that the training is up to date by performing an annual evaluation of the individual's training requirements. A holdover from a previous system used at NSTec/LAO is the *Master Skill of Craft List* that is also used by some of the laboratory owners. This consists of a binder in the laboratory that contains the individual's section training requirements and certifications.

The corporate office is responsible for coordinating ES&H matters, including VPP and ISMS, and provides guidance to ES&H staff at all NSTec locations, including LAO and Livermore Operations. The corporate office is also responsible for developing the curricula of training courses and for maintaining training records for all NSTec/LAO and subcontractor employees. NSTec/LAO has an ES&H trainer and a training coordinator with a title of Training Point of Contact (TPOC). The TPOC sends the course completion data to the corporate training office, which then inputs the training data into the Plateau database. The TPOC has access to employee training records, but is not authorized to make any changes in the employee training records. All updates in training records are made by the corporate training office.

To maintain training records, NSTec/LAO uses the comprehensive Plateau database, which automatically sends e-mails to employees whose training is coming due in 90, 60, and 30

days. Training records reviewed by the Team showed that the training is current for employees and subcontractors. A few cases of lapses in training were attributed to extended absences due to illness or business travel, and a few other lapses were attributed to out-of-date training requirements from previous assignments.

NSTec/LAO section managers are experimental scientists with advanced degrees or engineers. These seasoned professionals play key roles in all aspects of the NSTec/LAO safety and health program. They participate in analyzing job hazards and help create employee belief that all work can be accomplished with zero accidents. All newly hired employees, including managers, complete a comprehensive new hire orientation program. During the orientation, employees are introduced to the five core functions and the seven guiding principles of ISMS and VPP. They are thoroughly indoctrinated that ISMS is the minimum expectation of DOE, that VPP is the target for excellence in ES&H, and that the key to achieving them is through employee ownership and involvement. Further training for supervisors and managers is provided through a course entitled "Core Supervisor Training," which contains a module designed specifically for each supervisor/manager. The course focuses on the duties of the individual manager and his/her staff. It outlines progressive disciplinary guidelines to be followed if employees fail to comply with policies and procedures. Additional formal training for managers includes communication training, such as *Crucial Conversations,* that provides managers with the tools they would need to guide employees in task-specific hazard awareness training.

Conclusion

NSTec/LAO has a systematic approach to provide safety and health training to its employees and subcontractors. Most training is developed and administered by the corporate office, but some specialized training is provided by outside training companies, LANL, and vendors (for equipment). The training courses are well structured to provide an excellent knowledge to the employees and subcontractors. The NSTec/LAO TPOC tracks the training needs of all workers and schedules original and refresher training. The TPOC also ensures that training records are accurate. NSTec/LAO meets the DOE-VPP requirements of the Safety and Health Training tenet for participation at the Star level.

VIII. CONCLUSIONS

NSTec/LAO managers effectively support and lead the workforce in improving the safety culture and are clearly committed to the continuous improvement and excellence in safety and health. Employee involvement in the safety and health program is embraced by the workforce. The workforce is mature and actively engaged in keeping its fellow workers safe. Improvements in the corporate hazard analysis processes will solidify the rationale for control selection. NSTec/LAO clearly demonstrated its commitment to worker safety with the use of engineered controls as the primary means to control high-energy hazards. A well-established training and qualification program ensures workers are appropriately trained to recognize hazards and protect themselves and coworkers. Consistent with OSHA and DOE-VPP programmatic guidance for small worksites, NSTec/LAO accident injury rates are below the comparable industry averages.

The Team strongly recommends that NSTec/LAO be admitted to DOE-VPP at the Star level.

APPENDIX A

Onsite VPP Assessment Team Roster

Management

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