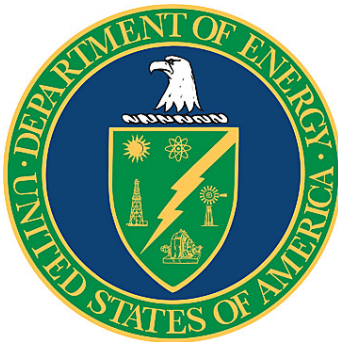


National Security Technologies, LLC/Livermore Operations

**Report from the Department of Energy
Voluntary Protection Program
Onsite Review
January 23-26, 2012**



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 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 the National Security Technologies, LLC/Livermore Operations, during the period of January 23-26, 2012, 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

AED	Automated External Defibrillator
ALARA	As Low as Reasonably Achievable
BLS	Bureau of Labor Statistics
CCD	Core Company Directive
CD	Company Directive
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
DART	Days Away, Restricted, or Transferred
DOE	Department of Energy
EAT	Emergency Action Team
eFEP	electronic Facility Execution Plan
eSEP	electronic Support Execution Plan
ES&H	Environment, Safety, and Health
GET	General Employee Training
HA	Hazard Analysis
HEDP	High Energy Density Physics
HEX	High Energy X-Ray
HHA	Health Hazard Assessment
HHE	Health Hazard Evaluation
HHI	Health Hazard Inventory
HSS	Office of Health, Safety and Security
HVAC	Heating Ventilation and Air-Conditioning
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
LLNL	Lawrence Livermore National Laboratory
LOTO	Lockout/Tagout
MA	Management Assessment
NAICS	North American Industry Classification System
NIF	National Ignition Facility
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NSTec/LO	National Security Technologies, LLC/Livermore Operations
OSHA	Occupational Safety and Health Administration
PEP	Project Execution Plan
PPE	Personal Protective Equipment
SWAT	Safety Walk-Around Team
Team	Office of Health, Safety and Security DOE-VPP Team
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 (NNSS) and has satellite operations across the country, including NSTec/Livermore Operations (NSTec/LO). NSTec/LO operates a leased facility in Livermore, California. The leased facility occupies approximately 35,000 square feet with 17 laboratories and associated office space. The scope of activities within the facility include applied science and engineering operations engaged in engineering, testing, and field operations for Lawrence Livermore National Laboratory (LLNL), NNSS, and other National Laboratories. The workforce at NSTec/LO consists of 75 scientists, engineers, designers, electro-optic/mechanical technicians, and administrative staff. NSTec/LO personnel provide design, fabrication, and implementation of sophisticated diagnostics systems, including ultra fast, electro-optic and recording systems, for capturing fast transient signals. NSTec/LO also supports the National Ignition Facility (NIF) located at LLNL, operating NIF Target Area systems, as well as providing diagnostics, vacuum, and alignment services. In a Memorandum of Understanding with the U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA) Nevada Site Office, the DOE/NNSA Livermore Site Office provides oversight of, and direction to, NSTec/LO.

Efforts by NSTec/LO to pursue the DOE Voluntary Protection Program (VPP) began in April 2006, and its application was received by the DOE Office of Health, Safety and Security (HSS) in late June 2008. Approval for NSTec/LO participation in DOE-VPP at the Star level occurred in December 2008. In accordance with the DOE-VPP programmatic requirements, an onsite triennial review is required by the HSS DOE-VPP team (Team). The Team conducted its review during January 23-26, 2012, to determine whether NSTec/LO continues to perform at a level deserving DOE-VPP Star recognition. This report documents the results of the Team's review and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding NSTec/LO's continued participation in DOE-VPP.

Based upon discussions and interviews with more than 30 workers, supervisors, and managers, as well as extensive observation of work activities in the laboratories and at NIF, the Team determined that NSTec/LO continues its pursuit of safety excellence, is committed to continuous improvement, has mature safety and health programs, and fully meets the tenets of DOE-VPP. While some opportunities for improvement were identified where NSTec/LO can further improve its performance (see Table 1), the Team recommends that NSTec/LO continue to participate in DOE-VPP at the Star Level.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
NSTec/LO should consider developing safety goals based upon desired worker actions or involvement, measure those actions or involvement, and use those measurements to improve safety performance.	9
NSTec/LO should consider expanding its outreach, mentoring, and assistance opportunities to include other staff members as a means of sharing and gathering lessons and new ideas.	10
NSTec/LO should assure all areas where lead is used are sampled and that consideration for encapsulation be considered.	12

I. INTRODUCTION

The Department of Energy (DOE) Voluntary Protection Program (VPP) onsite review of National Security Technologies, LLC (NSTec)/Livermore Operations (LO), in Livermore, California, was conducted January 23-26, 2012.

The NSTec/LO Facility is a leased facility, with approximately 40 percent offices and 60 percent laboratories. NSTec/LO is an applied science and engineering facility engaged in engineering, testing, and field operations for the Lawrence Livermore National Laboratory (LLNL), Nevada National Security Site (NNSS), and other National Laboratories. NSTec/LO provides design, fabrication, and implementation of sophisticated diagnostic systems, including ultra fast, electro-optic and recording systems, for capturing fast transient signals. NSTec/LO supports NNSS field experiments while engaging in similar work at the laboratories. NSTec/LO also supports the National Ignition Facility (NIF) located at LLNL, operating NIF Target Area systems, and providing diagnostics, vacuum and alignment services.

The Electro-Optics Laboratories test, characterize, evaluate, and assemble electronic and electro-optic diagnostic systems that include electronic imaging cameras, optical x-ray streak cameras, and related equipment. The Phototube Process Laboratory's main process area is used to produce phototubes and detectors. In addition to the main process area, the facility includes a research and development laboratory, a scanning electron microscope, a characterization laboratory, a cleaning room, and an image test room. Calibration Laboratories characterize, calibrate, and repair high-speed diagnostics for the High Energy Density Physics (HEDP) experiments. These facilities include an X-Ray Laboratory with High Energy X-Ray (HEX), Henke, and Manson sources and multi-wavelength Short Pulse and Long Pulse Laboratories.

NSTec/LO is organized into the following four major laboratory sections: Advanced Sensor Development; Electro-optics Engineering; HEDP; and NIF Target Area Operations. The Site and Administration, Production Engineering, and Facilities sections provide ancillary support across the facility and to NIF. The NSTec/LO workforce consists of 79 scientists, engineers, electro-optic/mechanical technicians, designers, and administrators. In a Memorandum of Understanding with the DOE/National Nuclear Security Administration (NNSA) Nevada Site Office, DOE/NNSA Livermore Site Office provides oversight of, and direction to, NSTec/LO.

Recertification in DOE-VPP requires an onsite review by the DOE Office of Health, Safety and Security (HSS) team (Team) to determine whether the contractor continues performing at a level deserving DOE-VPP recognition. The Team evaluated NSTec/LO safety programs against the provisions of DOE-VPP. During the site visit, the Team observed work activities; attended management meetings, section work planning meetings, and safety committee meetings; evaluated relevant safety documents and procedures; and conducted interviews to assess the strength and effectiveness of NSTec/LO health and safety programs.

The Team had contact with approximately 50 percent of the workforce, including managers, laboratory scientists, 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/LO workers include lasers, high-voltage electricity, 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/LO)					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Rate	DART* Cases	DART Case Rate
2008	129,400	0	0	0	0
2009	138,453	1	1.4	0	0
2010	138,032	2	2.9	1	1.5
2011	159,837	0	0	0	0
Best 3 Years	427,690	1	0.5	0	0.
Bureau of Labor Statistics (BLS-2010) average for NAICS** Code # 54138 (Testing Laboratories)			1.3		0.8
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
2011	2416	0	0.00	0	0.00
Best 3 of 4-year Total	5,665	0	0.00	0	0.00
Combine Total Best 3 of 4 years	433,355	1	0.5	0	0.0
Bureau of Labor Statistics (BLS-2010) average for NAICS Code # 54138 (Testing Laboratories)			1.3		0.8

* Days Away, Restricted, or Transferred

**North American Industry Classification System

TRC Incidence Rates, including subcontractors: 0.5***DART rates, including subcontractors: 0.0*****Conclusion**

DOE-VPP has adopted 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. For small sites where a single or relatively small number of incidences would cause the worksite's disqualification when using the normal 3-year rate calculation, OSHA uses an alternative method for comparison using the average of the best 3 of the past 4 years. Those criteria are used if two injuries per year in any of the previous 3 years would exceed the published rates for the comparison industry. DOE has adopted a simpler approach to use the best 3 out of 4 years approach for sites with less than 200,000 work hours per year to compensate for the amplification of injury rates for those sites. NSTec/LO's accident and injury rates using the small site criteria are 62 percent below the comparable industry averages and clearly 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.

In 2008, the review Team found that NSTec/LO was characterized by a commitment to safety excellence led by managers who are totally committed to providing their employees the safest possible environment in which to work. That strong commitment to safety preceded the company's decision to pursue VPP. The 2008 Team observed that VPP was well understood by managers and employees not as another set of requirements, but as recognition for an existing culture of excellence which demands continuous improvement. NSTec/LO is led by the Operations Manager, who reports to the NSTec Corporate Office in Las Vegas, Nevada. The Operations Manager and his management team have essentially remained unchanged since the 2008 review. The strong commitment to safety observed in 2008 continues to be a part of everyday activities. The core value in the corporate NSTec policy statement, "NSTec is committed to effective integration of Environment, Safety, and Health (ES&H) requirements into all facets of work planning and execution," is reflected in the managers' and employees' approach to all aspects of daily tasks.

The NSTec/LO ES&H representative, who is a Certified Safety Professional (CSP), continues to provide daily health and safety support services at the site and is responsible for providing guidance on ES&H matters to the various managers, employees, and contractors at NSTec/LO. This position acts as a liaison between NSTec corporate ES&H and local ES&H needs. As identified in the previous assessment, the site has ready access to additional certified professionals for support of operations as needed at the corporate level. These include CSPs, Certified Industrial Hygienists, and a Certified Health Physicist.

Since 2008, two managers have retired and four employees have been added to the workforce. The retired managers were replaced by subordinates from within the respective work organizations. This stability and continuity of the organization fosters a close-knit work environment. This work environment is augmented by a series of Desktop Instructions, accompanying JHAs, Health Hazard Evaluations (HHE), and training requirements that have been implemented to ensure that all work is performed in accordance with the Integrated Safety Management System (ISMS) and Quality Assurance requirements as outlined in NSTec Core Company Directive (CCD), CCD-QA05.001, *NSTec Integrated Work Control Process*.

The NSTec/LO management team encourages employees to expand their professional knowledge by participating in conferences, seminars, and attending professional development events. Workers interviewed during this assessment praised the support exhibited by

NSTec/LO leaders. The 2012 review Team attended the managers meeting and the HEDP safety meeting. The proactive involvement by NSTec/LO managers is positive, supportive, and continually demonstrates their commitment to excellence.

Since the 2008 review, NSTec/LO has improved its processes to manage work by instituting an electronic tool to capture the execution plans and guidance contained therein. Each of the five section managers develops an electronic Support Execution Plan (eSEP) for their respective sections. The guiding document for developing, revising, approving, and maintaining an eSEP is now Company Directive (CD), CD-G610.001, *Risk and Work Authorization Management*. The eSEP defines the scope of support activities and serves as the implementing tool for continuing these activities established under baseline conditions to support projects, facilities, and other workscope activities. The primary purpose of eSEP is to serve as a planning tool to define how the section manager performs workscope activities and to address integration of quality assurance and risk management into work execution. The eSEP directive requires a Hazard Analysis (HA) per CD-0400.004, *Hazard Analysis for Project and Support Execution*. This directive establishes the hazard analysis process, which identifies safety, health, and environment hazards and their associated work controls at the planning stage. The HA identifies mitigation and controls to be implemented during work. Another level of management planning is found in the Project Execution Plans (PEP). Like the eSEP, the PEP describes the work to be performed, the location, and resources for performing the tasks within the project. To support the management planning for facility-related needs, the NSTec/LO Facility Manager generates an electronic Facility Execution Plan (eFEP). The eFEP details the upgrades; floor spacing; power; life safety systems; heating, ventilation; and air-conditioning (HVAC); and other utilities needed to operate NSTec/LO. Guidelines for creating eFEP are captured in CD-G610.001, *Risk and Work Authorization Management*.

The HA is still used as a tool to develop Management Assessments (MA), which are conducted throughout the year by Section Managers following CCD-QA09.001, *Management Assessment Program*. All issues identified during MAs continue to be documented, entered into the company-wide issue tracking system, and processed according to CCD-QA03.001, *Quality Improvement (Issues Management)*.

Consistent with observations documented in the 2008 VPP assessment, annually, the NSTec Corporate ES&H staff reviews NSTec/LO for health risks. This HHE reviews the NSTec/LO Hazard Communication Program, Laser Safety Program, Toxic Metals, and Hazardous Materials Control. The HHE is documented in a report to the Operations Manager. Other program evaluations are conducted as required.

The NSTec/LO annual performance review process continues to set safety goals for employees, and safety performance is weighted and used as a factor in determining merit increases. NSTec/LO has a comprehensive, progressive disciplinary policy that includes provisions for formal verbal counseling, written warnings, suspension, and termination as appropriate. As discussed in the 2008 assessment, the NSTec/LO has not found a need to use the disciplinary process. NSTec/LO still requires subcontractors to work in a safe manner while performing their duties. Most subcontracted work performed for NSTec/LO is work beyond minor maintenance, such as HVAC, electrical, and plumbing. The selection process remains the same as documented in the 2008 assessment.

Conclusion

NSTec/LO continues to exhibit safety excellence that is led by managers who are totally committed to providing their employees the safest possible environment in which to work. VPP is well understood by managers and employees as recognition for an existing culture of excellence, which demands continuous improvement. Managers and workers alike embrace this concept and strive to assure safety and improvements are integrated into daily activities. NSTec/LO fully meets the requirements of 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 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.

As noted by the 2008 Team, keeping employees fully engaged in the safety program is a top priority at NSTec/LO. Employees and managers demonstrate a mutual respect for each other indicating effective communications. Issues, concerns, suggestions, and recommendations are given the appropriate level of attention, and problems are resolved in a timely manner. Managers have empowered employees to proactively administer the safety and health program.

The 2008 Team identified an opportunity for improvement that NSTec supervisors and managers should evaluate options to increase employee participation, including those at remote facilities, by giving safety presentations at safety or staff meetings on a rotating schedule. NSTec/LO has implemented this suggestion and employee-run safety meetings are held at all facilities, including NIF. The Team attended the safety meeting of HEDP where two employees gave an interesting presentation on Garage Safety. They discussed basic, personal protective equipment (PPE) used in home projects, such as leather gloves, safety glasses, dust masks, as well as the highly sophisticated saw blade, which stops after sensing a soft tissue. The other employees were engaged and participated in open discussions that included items from the last meeting, HEDP safety goals, and the results of the safety issues identified in the safety walkdowns of the previous month. For example, one goal was to ensure that employee training plans are current and that scheduled training is completed. Although some required training was overdue, none was associated with work qualification requirements. The Team was told that this meeting was representative of the monthly safety meetings that are conducted at all NSTec/LO departments. All employees are given the opportunity to present safety topics throughout the year.

The process for selection of safety goals includes suggestions from managers and employees on challenges for the upcoming year. Goals are discussed at the beginning of the year via safety meetings, such as the one observed on this review. Developing challenging safety goals for NSTec/LO has been difficult because its history and performance are already indicative of a very effective system. While they continue to search for innovative means to improve a very good process, they struggle to identify goals that will drive further improvements. An opportunity for improvement may exist for NSTec/LO to expand its selection of safety goals by evaluating the actions workers are expected to take to improve safety performance. Examples might include participation in inspections, evaluations, peer observations, or management observations. By

identifying and measuring those expectations, NSTec/LO can develop safety goals based upon desired employee actions that continually improve safety performance.

Opportunity for Improvement: NSTec/LO should consider developing safety goals based upon desired worker actions or involvement, measure those actions or involvement, and use those measurements to improve safety performance.

As noted in 2008, the employees continue to participate in the monthly safety inspections in the Safety Walk-Around Team (SWAT). Employees are selected at random to accompany the team on safety inspections. Observations confirmed employees throughout NSTec/LO's offices, shops, laboratories, and site facilities maintain a high standard of housekeeping for their work environment.

The work package process requires employee involvement through the identification and understanding of the hazards of the work they perform. Depending on the level of hazard associated with the work package, employees participate in an annual review of JHAs and standing work packages. Managers ensure prejob and postjob debriefings are documented in accordance with company procedures. Additional details are provided in the Worksite Analysis section.

Another means of employee involvement in safety is the Emergency Action Team (EAT). Employees volunteer to participate in EAT. These teams participate in biannual drills, including shelter-in-place and fire evacuation drills, and fire extinguisher training classes. Yellow triangle-shaped signs strategically placed outside the member's office or cubicle identify them as an EAT member.

All employees interviewed by the Team clearly understood their rights under title 10, Code of Federal Regulations, part 851 (10 CFR 851), including the right to pause or stop work in the event of a safety concern. They further understood their rights to access safety and health information, how to report safety issues and concerns, and were comfortable exercising those rights with the confidence that safety issues would be addressed in a timely manner. NSTec/LO continues to utilize an informal "Time Out" process, which allows an employee to step back and resolve the concern before proceeding. The procedure, CCD-QA05.001-008, *Time Out/Stop Work*, applies to work performed by the employee, work performed by other employees, and work performed by subcontractors. In all interviews, employees indicated that they not only were responsible to stop work if they felt a potential hazard or unsafe condition was present, but felt they would not be adversely affected for stopping work. Employees carry laminated cards attached to their lanyards describing the time out and stop work process instructions.

Employees can also participate in the NSTec/LO Safety Suggestion Program. In this program, employees may submit their suggestions through a local suggestion box, electronically through the ESH&Q Web page, by calling the safety suggestion coordinator, or by speaking directly with their supervisors. The "Great Catch" award is also used to encourage and reward employee participation. These awards (typically a \$25 check) can be given for any act or suggestion that makes an improvement. Nominations are submitted through a Web page.

NSTec/LO continues to promote employee involvement through safety committees. The VPP Continuous Safety Improvement Team, As Low as Reasonably Achievable (ALARA) Committee, and the Senior Electrical Review Board all provide opportunities for employees to become involved in safety improvement. NSTec/LO also participates in the NNSS Integrated Safety Management Council tasked with monitoring long-term implementation of ISMS at NNSS.

The Livermore Employee Safety Committee actively promotes safety at work and at home through a variety of means. For example, they participate in the Annual Safety Calendar Artwork contest sponsored by the NSTec Corporate Office in Las Vegas, Nevada. Children of employees submit artwork demonstrating safety awareness. In addition, the Livermore Employee Safety Committee receives safety information from the NSTec/LO ESH&Q representative, and the "Safety Cents" newsletter is sent to committee members monthly.

In Team interviews, the employees were quite candid and indicated they felt comfortable with the amount of information they receive from their safety committees and the means of receiving that information (E-mail, newsletter, etc). Newsletters reviewed by the Team contained a variety of effective safety topics suggested by employees and further developed by the various safety committees.

NSTec/LO has been active in its outreach activities by participating in workshops at the Voluntary Protection Programs Participants' Association Annual Meeting, mentoring other DOE sites, and participating in the "Great California Shake Out" statewide earthquake drill. The assigned safety and health specialist has served as a team member on OSHA and DOE-VPP Teams. Outreach and mentoring activities have been primarily conducted by that specialist. He is highly qualified and well regarded by the employees and managers as an effective VPP Champion and safety advocate. His efforts are commendable, but NSTec/LO also has many other highly qualified engineers, scientists, and other technical staff that can assist on VPP assessments and other outreach activities. NSTec/LO should consider expanding its outreach, mentoring, and assistance opportunities to include other staff members as a means of sharing and gathering lessons and new ideas.

Opportunity for Improvement: NSTec/LO should consider expanding its outreach, mentoring, and assistance opportunities to include other staff members as a means of sharing and gathering lessons and new ideas.

Conclusion

Interviews with managers and employees revealed that keeping employees fully engaged in the safety program continues to be a top priority at NSTec/LO. Employees and managers communicate freely and give issues, concerns, suggestions, and recommendations the appropriate level of attention. Managers empower employees to proactively administer the safety and health program at this site. NSTec/LO continues to meet the requirements of the Employee Involvement tenet 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.

In 2008, the review Team determined that worksite analysis at NSTec/LO was comprehensive and robust. There were processes in place to identify and analyze hazards throughout the facility, and employees supported and used these processes in performance of their daily work activities. The multi-tiered approach to safety was highly effective in providing for a safe working environment.

NSTec/LO continues to maintain its baseline health and safety surveys and analyses. These are augmented by NSTec HHEs and internal assessments to capture the hazards encountered by NSTec/LO employees. NSTec/LO still uses the Health Hazard Inventory (HHI). The HHI contains an itemization of potential health hazards in the workplace; an inventory of chemical, physical, and biological stressors; the number of employees involved; engineered and administrative controls in place; and required PPE. The information from the HHI is now documented in the new Enterprise Integrated Safety Management-Exposure Assessment database for easy retrieval. The Health Hazard Assessment (HHA) details the qualitative analysis of the hazards. The HHA is conducted by corporate ES&H personnel and includes an exposure assessment of the stressors identified in the HHI, the specifics of exposure monitoring, and a synopsis of risk ranking and assessment. The HHE documents the final report of the analysis and includes a list of deficiencies, recommendations, and corrective actions.

The 2012 Team discussed portions of this process with NSTec/LO employees regarding two new activities that are being planned. One of the new activities being planned is the introduction of tritium-contaminated components from NIF into the facility. The NSTec/LO facility has never had to address the potential for radioactively contaminated material within its building. Another activity being planned is the construction of very high voltage components for a customer at NIF. The voltages being discussed are in the kilo-volt range with currents in kilo-amperes. Both activities are in the planning stages. Discussions with laboratory workers and safety professionals indicated that both activities are at the preliminary planning stage with input on hazards, analysis, and controls being sought from across NSTec. Once the projects are completely defined, the NSTec process will be applied to identify hazards, analyze the hazards, and develop the controls necessary to preclude harm to workers.

During the 2008 review, the Team verified that the ISMS process was rigorous, comprehensive, and numerous reviews and dry runs were performed before any work occurred. Procedural development, associated with laboratory work activities, was reviewed multiple times with worker input into the step-by-step laboratory procedures. The facility continues to apply a multitiered approach to identifying and controlling hazards. This approach starts with

divisional work packages that encompass several laboratories, individual work packages for higher hazard activities, and specific work procedures and associated JHAs. During this review, the Team noticed the use of lead sheets in a HEX-generating laboratory as shielding to attenuate the dose. When queried by the Team if the lead sheeting was part of the lead sampling program, verification could not be provided to the Team by the facility. It is suggested that NSTec/LO include testing and documentation for lead and to consider encapsulation or some other barrier for the lead sheeting.

Opportunity for Improvement: NSTec/LO should assure all areas where lead is used are sampled and that consideration for encapsulation be considered.

Other tools noted in the 2008 assessment continue to be effectively used. Examples include the program for acceptance of specialized electrical equipment not listed by a nationally recognized testing laboratory, the corporate NSTec process to evaluate upsets and identified abnormal conditions, the NSTec corporate process for accident/incident evaluation, and trend analysis. One laboratory supervisor commented about the SWAT process that “just when we think we have covered everything, another set of eyes finds something we never considered, so we welcome the reviews.”

Conclusion

Worksite analysis is comprehensive and robust. Processes remain in place to identify and analyze hazards throughout the laboratory, and employees subscribe to and utilize these processes in performance of their daily work activities. The multitiered approach in place is highly effective in providing for a safe working environment. NSTec/LO fully meets the requirements of the Worksite Analysis tenet.

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

During the 2008 review, the Team observed NSTec/LO employees using safety and health rules to assure a safe work environment and to reduce hazards and potential exposures. The site ES&H representative provided ES&H training to local personnel and directly provided a number of support services. NSTec/LO was served by an experienced CSP to provide continuous proactive services and programs.

The Team observed many examples of good controls that had been implemented throughout the laboratory spaces at NSTec/LO. The preferred approach was to eliminate hazards through substitution where possible. In 2008, there were many examples of hazards that were eliminated, such as chemicals, dye lasers, packing material, and outsourcing certain hazardous processes. NSTec/LO continues to pursue elimination of hazards as a first alternative. For example, since 2008, NSTec/LO has replaced all dye lasers with solid state equipment, removing a significant carcinogenic hazard.

When substitution to eliminate hazards was not practical, engineered controls were put in place. The Team noted numerous engineered controls throughout the laboratory in 2008 and in 2012. Many of these controls were a result of improvements suggested by employees. Double encapsulation of electrical components that present severe electrical hazards, such as large capacitors, was prevalent. This approach assures that two sets of Plexiglas barriers must be intentionally removed before a person comes in contact with hazardous energies. Installation of the “stop saw” on their table saw was an enhancement since the 2008 review. Also, lift gates on transport vehicles and a new lifting mechanism for bulky objects have been installed since the 2008 review. Administrative controls deemed effective in 2008 remain in place and continue to be effective as of this assessment.

The comprehensive PPE program remains in place at NSTec/LO. This includes a variety of safety eyewear due to the nature of potential hazards at the facility. The laser laboratories use wavelength-specific laser safety eyewear. The Team did not find any issues relating to the safe use of equipment or PPE during this review. Managers confirmed that safety equipment purchased by employees meets the appropriate standards. Safety glasses are required when operating machines in the Model Shop and in the laboratories when employees are exposed to hazards, such as flying debris or chemical splashes. Nonprescription safety glasses are issued directly to the employees, and a container of safety glasses is located near the laboratories that require safety glasses. In 2008, an opportunity for improvement was posting of PPE requirements in workspaces. Since 2008, signs have been posted notifying workers of the requirements for safety glasses and hearing protection. All workers were observed by the Team wearing the appropriate PPE.

Overall, the Team found that safety and health rules continue to be followed by all employees. Interviews with employees reinforced the 2008 conclusion that they know and understand the disciplinary process and consequences of failing to adhere to the rules. Those interviewed felt this process was both fair and consistent and gave examples of positive reinforcement received from supervisors and managers for good work practices.

There were no discrepancies identified in the review of the emergency preparedness documentation. The facility participates in drills locally and internally to the facility. As previously mentioned, the facility participated in the “Great California Shake Out” state wide earthquake drill, which involved Federal, State, county, and municipality emergency response organizations. The *Emergency Response Organization* description and the *Emergency Management Plan* are the primary documents that provide the framework for the comprehensive plan. The documents identify the roles and responsibilities of staff and how all EAT personnel respond in actual emergencies, as well as during drills and exercises.

With respect to radiation protection program requirements, NSTec/LO currently uses only sealed radioactive sources that are exempt from 10 CFR 835 requirements. However, there are now four radiation generating devices (HEX, Henke, and 2 Manson units), which produce ionizing radiation. These four devices operate independently, and two are contained within the same laboratory. Operators of these units must complete training in General Employee Radiological Training, Radiation Generating Devices Training, and Radiological Worker I Training. Design features that minimize the potential for occupational exposure to X-rays include redundant interlocks and micro switches, enclosure wall thickness, and a fully sealed enclosure. Also, lead shielding is used for HEX, which is discussed in a previous opportunity for improvement in the Worksite Analysis section.

The Occupational Medical program and providers remain unchanged since 2008. Automatic External Defibrillators (AED) continue to be available at the facility for emergency use, and the number of trained staff has increased from 80 percent in 2008 to 90 percent. The goal continues to be for 100 percent of the personnel at NSTec/LO to be certified in Cardiopulmonary Resuscitation (CPR) and the use of AEDs. NSTec/LO has also continued the variety of wellness activities offered for employees.

Conclusion

NSTec/LO employees use safety and health rules to assure that a safe work environment exists and to reduce hazards and potential exposures. The site ES&H representative provides ES&H training to local personnel and directly provides a number of support services. NSTec/LO is served by experienced and certified safety professionals to provide continuous proactive services and programs. NSTec/LO meets all DOE-VPP criteria for the Hazard Prevention and Control tenet.

VII. SAFETY AND HEALTH TRAINING

Managers, supervisors, and employees must know and understand the policies, rules, and procedures established to prevent exposure to hazards. Training for health and safety must ensure that responsibilities are understood, personnel recognize hazards they may encounter, and they are capable of acting in accordance with managers' expectations and approved procedures.

The 2008 Team found that training programs at NSTec/LO are comprehensive and adequately address the training needs for the accomplishment of the NSTec/LO mission. In 2012, NSTec/LO employees felt that its ES&H training adequately prepared them for hazard identification in their respective work environments and gives them the tools to keep themselves and their coworkers safe. While the Team did not have the opportunity to observe any training, as none was scheduled during the review, the Team did review training records, course curricula, and reports. The Team also observed several employees gain access to their training plans and training histories online. Additionally, the status of required training was an agenda item during the Operations Manager's manager meeting, as well as during the HEDP Section Managers' staff meeting, both of which the Team had the opportunity to attend.

The Team reviewed the training program as defined in NSTec CM-TRNG.001, *Training Program Manual*. This manual and all training material, with the exception of some vendor provided training (e.g., Red Cross first aid and CPR), are developed by the NSTec training office in Las Vegas, Nevada. The NSTec/LO ES&H specialist serves as an instructor for some of the safety courses, such as lockout/tagout (LOTO) and electrical safety.

The NSTec/LO Human Resource specialist serves as the training coordinator. This dual-duty specialist is responsible for all training related matter. She sends the course completion data to the corporate NSTec training office in Las Vegas, Nevada, which enters the data into the Plateau Database. NSTec/LO managers, employees, and the training coordinator have "read only" access to database. The database sends 90-day, 60-day, and 30-day advance notices of upcoming training to the employees and their managers. The NSTec/LO training coordinator schedules all training and runs monthly surveys to ensure that employees are current in training.

As observed by the 2008 Team, each NSTec/LO operation that relies on skill of the craft continues to maintain a "Skill of Craft" binder that records all training a section employee has taken. Each binder contains the *Master Contact Skill of the Craft List*. This list identifies each task and the qualification method used by the employee. Qualification method categories include *Past Experience*, *Current Demonstration*, *Certificate/License*, and "Other" for each identified task. The Team reviewed these binders for each of the laboratory sections. They were current and documented that the employee is adequately qualified to perform certain tasks. The Team still considers the implementation and use of the Skill of Craft binder by NSTec/LO as a best practice.

The Team review of training records indicated that most employees are current in their training. No instances of lapses in the job-specific training were noted. There were a few cases of lapsed training due to an employee being on leave or travel, unavailability of training, or the current duties not requiring the training due to reassignments. NSTec/LO is

working to update the training plans of all employees so that the training plans are for the current job assignment.

All new employees are required to attend General Employee Training (GET), which provides the minimum safety and health requirements for access to their work area. This training includes: ISMS; VPP; 10 CFR 851, *Worker Safety and Health Program*; safety and health policy; general safety rules; fire safety; electrical safety; LOTO; radiological and ALARA awareness; and hazard communication, including Material Safety Data Sheets. The training material for the GET was comprehensive and was written in very user-friendly language. The Team interviews with a significant number of employees and a few managers showed that the NSTec/LO personnel understand the hazards of their work and believed they had been adequately prepared for the hazards and conditions they might encounter.

Conclusion

NSTec/LO has a comprehensive and systematic approach to training that ensures personnel are appropriately trained and qualified prior to performing work within NSTec/LO-managed facilities. The training records are maintained in the Plateau Database and are accessible to the employees and the managers. Most employees are current in all of their training specified in their training plans. The employees and managers feel that the safety and health training provided by NSTec is excellent to perform their duties safely at work and at home. NSTec/LO continues to meet the requirement of the safety and health tenet of DOE-VPP at Star level.

VIII. CONCLUSIONS

NSTec/LO managers effectively support and lead the workforce in improving safety 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 their fellow workers safe. The approach to hazard identification, analysis, and control selection is rigorous and thorough. NSTec/LO clearly demonstrates its commitment to worker safety with the use of substitution to eliminate hazards and 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.

The Team strongly recommends that NSTec/LO continue to participate in DOE-VPP at the Star level.

APPENDIX A**Onsite VPP Assessment 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
John A. Locklair	DOE/HSS (301) 903-7660	Team Lead Management Leadership; Worksite Analysis; Hazard Prevention and Control
Steve K. Singal	DOE/HSS (301) 903-2990	Employee Involvement; Safety and Health Training