

D.P.U. 19-133
Attachment DPU-S-1(1)
May 26, 2020

NEXTSUN ENERGY, LLC

SAFETY AND HEALTH PROGRAM MANUAL

NEXTSUN ENERGY, LLC

Safety & Health Processes

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NEXTSUN ENERGY, LLC

Incident Prevention Plan

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NEXTSUN ENERGY, LLC

Safety Commitment Statement

Each person who works at NextSun Energy, LLC (NSE) is important. Our success with Customers, and consequently the overall success of this business, depends upon the individual -- his or her personal skills, energies and contributions. Because we are united in achieving success, we are concerned and supportive of each other.

NSE strives to provide a safe and healthful workplace by subscribing to these principles:

- ;;... Incidents can be prevented through implementation of effective safety and health control policies and processes.
-);> Safety and health controls are major parts of our daily work.
- ;;... Incident prevention is good business. **It** increases productivity and minimizes human suffering.
-);> Management is responsible for providing a reasonable and safe workplace for employees.
- ;;... Employees are responsible for following safe work practices, NSE and customer rules, and for preventing incidents.
-);> Management must monitor NSE safety performance, working environment and conditions to ensure that safety objectives are achieved.
- ;;... Our safety process requires the participation of all employees -- to improve safety awareness, and to prevent injuries.

Your involvement, cooperation and personal commitment to safety are essential. Keeping a safe workplace is a team effort. We need you on this team. NSE welcomes any helpful comments.

Together, we can make the difference. Together, we *CAN* prevent injuries. We must work, every minute of every hour of every working day, to keep each other safe in the workplace.

Jacob Laskin
President

1. AUTHORITY & ACCOUNTABILITY

- a. The President of NextSun Energy, LLC (NSE) shall accept the responsibility for providing resources and guidance for the development and implementation of the Safety & Health Process; selecting and designating the Safety Director; and establishing management policies and procedures toward effective implementation of the Safety & Health Process.
- b. The Safety Director shall be responsible for the overall implementation of the working plan. The President of NSE shall have the authority to delegate portions of the process as he deems appropriate to subordinates. However, the Director will be responsible for the implementation of the plan.
- c. NSE Supervisors will have the duty and authority to approve and carry out all disciplinary actions for those who violate the policies, procedures and/or rules and regulations relating to this Safety & Health Process. Supervisor responsibilities and duties relating to this safety and health process are also explained in greater detail on the following pages.
- d. Each Employee will be responsible for abiding by the policies, procedures, rules, regulations and orders set forth by this Safety & Health Process. Each Employee should become actively involved in this process to assist NSE in maintaining a safe and healthful workplace environment for all involved. Individual Employee Responsibilities relating to safety and health are explained in greater detail on the following pages.
- e. Contractors that perform work at a NSE project location are responsible for ensuring that their personnel perform this work in a manner that complies with NSE safety standards, as well as federal occupational safety and health requirements and other applicable safety and health regulations.
- f. NSE Incidents Prevention Plan and Safety & Health Process will be made available to all contractors for review. Likewise, contractors will provide to the Safety Director a copy of its written safety and health processes relating to work that will be performed on NSE projects.

2. SAFETY DIRECTOR RESPONSIBILITIES

- a. The President of NSE will designate an individual to serve as Safety Director for NextSun Energy, LLC
- b. The Safety Director shall be responsible for the overall implementation of NSE's Safety & Health Process. This shall include taking steps to identify workplace hazards and conditions that are unsanitary, unhealthy or dangerous to employees. When such hazards or conditions are identified, the Safety Director shall have responsibility to initiate timely and appropriate corrective actions.

- c. The Safety Director shall be knowledgeable about general workplace safety and health issues. This knowledge shall be gained through training and experience.
- d. The Safety Director shall monitor and report the results of safety and health processes, training and incidents prevention activities directly to the President of NSE. The reports will include:
 - $\frac{3}{4}$ Records of new hire safety orientations and ongoing safety training activities
 - $\frac{3}{4}$ The tracking of incidents and “near miss” incidents
 - $\frac{3}{4}$ Injury and illness incidents that are recordable on the OSHA 300 form
 - $\frac{3}{4}$ Workers’ compensation injury and illness initial and ongoing reports
 - $\frac{3}{4}$ Insurance company loss runs and statistical analysis
- e. Other Safety Director responsibilities include, but shall not be limited to:
 - $\frac{3}{4}$ Conduct or schedule to be conducted, safety inspections, surveys, audits and assessments for all NSE offices and projects
 - $\frac{3}{4}$ Review safety inspection reports and unsafe or unsanitary conditions that are reported by Supervisors, Employees or others. Obtain corrective actions as needed
 - $\frac{3}{4}$ Resolve questions, approve and/or recommend necessary expenditures to correct unsafe conditions
 - $\frac{3}{4}$ Actively support and promote NSE and customer safety and health processes and activities
 - $\frac{3}{4}$ Plan, coordinate, perform and/or delegate safety training of supervisors and employees
 - $\frac{3}{4}$ Maintain appropriate training and testing records for each employee
 - $\frac{3}{4}$ Report unsafe employee practices and/or behaviors to their respective supervisors
 - $\frac{3}{4}$ Review and monitor any disciplinary actions and/or remedial training
 - $\frac{3}{4}$ Conduct or delegate regular safety meetings with supervisors and employees to promote safety awareness and compliance with the Safety & Health Process
 - $\frac{3}{4}$ Investigate or cause the investigation of at-work incidents, illnesses and “near miss incidents. Assist as needed when these investigations are performed by supervisors or others

- ¾ Review investigation reports to determine possible preventative actions. Take immediate corrective actions as required
- ¾ Ensure that reportable injuries are being documented on applicable state workers' compensation forms and OSHA forms 300A, 301 and 300 as required
- ¾ Review the safety and health processes of contractors before they perform work on a NSE and customer projects. Contractor safety and health processes must meet OSHA requirements. They should be effective in protecting contractor personnel and also NSE and customer employees who may be exposed to hazards associated with work performed by contractors

3. SUPERVISOR SAFETY RESPONSIBILITIES

- a. Supervisors shall be responsible for following and promoting safety rules, policies and safe work procedures while employed by NSE.
- b. For the purposes of this process, the term "Supervisors" shall be defined as any employee who has the authority to direct the work of other employees.
- c. Supervisors shall be concerned about the safety and welfare of all employees. Consequently, if a supervisor observes a hazard or safety violation in an area outside of his or her direct authority, he or she shall report this to the supervisor in charge of the work area and then to the Safety Director.
- d. If the hazard or violation presents an immediate danger to life or health, the supervisor observing the danger shall intervene immediately to the extent necessary to prevent injury or harm to persons without causing danger to him or herself. This protection of persons is of primary importance! Preventing damage to NSE or customer facilities and/or property is a secondary priority.
- e. Any observed hazard requiring corrective action that is outside the supervisor's authority and/or ability to correct or eliminate, shall be immediately reported to a Safety Director.
- f. Supervisor job responsibilities include:
 - ¾ Help ensure compliance with NSE and customer's safety rules and safe work procedures through daily supervision of employees. Take corrective and disciplinary action as needed
 - ¾ Conduct and/or assist in the safety orientation of new hires about division safe work practices and potentially hazardous conditions within the assigned work area. This includes ensuring that personal protective equipment (PPE) is either issued or available to new hires and re-assigned employees. Initial safety training of new and re-assigned employees shall be completed before they begin duties for NSE
 - ¾ When possible, correct unsafe conditions anywhere they are observed. If the situation

involves another supervisor's area of responsibility, or if additional authorization or resources are required, inform the Safety Director or, in his or her absence the responsible Division Manager

- $\frac{3}{4}$ Help ensure that all incidents and "near miss" incidents are reported by employees
- $\frac{3}{4}$ Investigate reported incidents and "near miss" incidents in accordance with NSE and customer's policies and procedures
- $\frac{3}{4}$ If an injury requires more than self-administered first aid, the supervisor will make sure that the employee receives first aid and medical attention as needed. This may include taking the injured employee to NSE's designated medical provider, or arranging for transportation. Report any such incident to the Safety Director immediately.
- $\frac{3}{4}$ In emergency situations, alert and cooperate with emergency medical, fire and/or police. Notify the Safety Director promptly after meeting immediate needs of the emergency.
- $\frac{3}{4}$ All supervisors shall work to develop and support safety awareness. This includes maintaining an open and responsive attitude when employees ask about or raise safety issues.
- $\frac{3}{4}$ All supervisors shall set a good example with respect to safety by their personal behavior. This includes wearing personal protective equipment in areas where it is required, and personally complying with NSE and customer's safety policies and safe work procedures.

4. EMPLOYEE SAFETY RESPONSIBILITIES

- a. Management considers the health and safety of each employee to be a NSE core value. All employees will share and respect this NSE value.
- b. Employees must assume primary responsible for their own safety because no other person can fulfill this role. Employees must make every initiative to protect their own safety and that of their fellow workers.
- c. Employees shall learn, understand and follow NSE and customer safety rules and safe work procedures. This includes maintaining an awareness of the potential hazards pertaining to their work assignment. Safety compliance is a condition of employment at NSE.
- d. Employees are not required to perform any task that they believe to be dangerous or unsafe.
- e. Other individual employee safety responsibilities:
 - $\frac{3}{4}$ Employees will perform those duties assigned by NSE through its supervisors.

- ³/₄ Employees will utilize personal protective equipment (PPE) when it is required.
- ³/₄ Before beginning special work or new assignments, employees will review applicable and appropriate safety rules.
- ³/₄ If an employee has any question about how a task should be done safely, he or she must suspend work on the task until he or she has discussed the situation with his or her supervisor. Together, the employee and the supervisor shall determine the safest way to accomplish the task.
- ³/₄ After discussing a safety situation with his or her supervisor, if the employee still has questions or concerns regarding the task, he or she shall be permitted to notify the Safety Director. Unsatisfactory answers and/or additional concerns shall be directed to President of NSE.
- ³/₄ If an employee observes what he or she believes is a hazardous condition, unsafe work practice, defective machine, tool, vehicle, facility or equipment, he or she shall report this immediately to his or her supervisor.
- ³/₄ If the supervisor is not immediately available, employees shall take action as necessary to protect others from what they believe is the hazard. This may include taking a malfunctioning machine or tool out of service so that it is not used by someone else. The employee then will notify a supervisor or the Safety Director at his or her earliest opportunity, and no later than the end of the day's shift.

5. SAFETY MEETINGS

- a. Meetings with employees shall be conducted periodically to discuss safety, health, environmental and security issues concerning NSE and customer operations. The primary function of these meetings is to promote safety awareness and communication throughout the workplace.
- b. Employees and supervisors shall attend safety meetings. Safety meetings shall be conducted by the Safety Director, Supervisor or some other person designated by the Safety Director or management.
- c. Should a scheduled meeting have to be postponed, it shall be held later on a date and at a time determined by the Safety Director, supervisor or some other person designated by the Safety Director or management.
- d. Safety meetings will include ongoing employee safety training and discussions to encourage safety awareness. Meetings will also address specific safety issues raised by employees.
- e. A written attendance record, signed by each employee, shall be maintained as documentation for every safety meeting.

6. EMPLOYEES REPORTING A HAZARD ARE PROTECTED

The purpose of this section is to state NSE policy and procedure regarding protection for employees who report a safety hazard. It affects all organizational units of NSE operations.

- a. It is the policy and philosophy of NSE that every employee must feel secure and comfortable in reporting a known or perceived safety hazard to his or her supervisor, to higher management within NSE, and to any appropriate governmental authority.
- b. To this end, and to protect the legitimate rights, health and safety of every employee, it is the policy of NSE that no person will discharge or in any manner discriminate against any employee who reports or calls to the attention of management what he or she believes to be a safety or health hazard; or any unsafe, unhealthy condition or situation in the workplace.
- c. Furthermore, no person will discharge or in any manner discriminate against any employee because such employee has filed any complaint, instituted or caused to be instituted any proceeding under or related to state or federal occupational health and safety law, has testified or is about to testify in any such proceeding, or because of the exercise by such employee on behalf of himself or others of any right afforded by state or federal law.
- d. Any employee who feels he or she has been discriminated against for any of the above reasons should report this directly to the Safety Director or an appointed alternate.
- e. The intention of this policy is to support legitimate employee comments, suggestions and complaints, and to ensure protection against illegal discrimination.
- f. At the same time, NSE will take appropriate action in response to the filing of a false claim, or a claim with little merit that NSE management judges to have been filed primarily to harass NSE, an individual employee or supervisor.

7. ACCESS TO EMPLOYEE EXPOSURE MEDICAL RECORDS

- a. Employees and former employees of NSE who are, have been or may be exposed to toxic substances or harmful physical agents, have direct access to exposure and medical records maintained by NSE, as required by OSHA Standard 1910.1020.
- b. NSE employees will be informed of the existence, location and availability of these records. Employees will be informed of their rights to have to access to these records. Request for these records will be made in writing.
- c. "Access" will mean the right and opportunity to examine and copy. Access to employee medical and exposure records will be provided in a reasonable manner and place. Access will be provided as promptly as possible. If access cannot be provided within 15 days after the employee's request, NSE will state the reason for the delay and the earliest date that the records will be made available.

- d. Responses to initial requests, and new information that has been added to the initial request, will be provided without cost to the employee or their designated representative. At the sole discretion of NSE, employees requesting access will be given records and the use of mechanical copying facilities so that the employee may copy the records; or lend employees their records for copying off the premises. Additionally, medical and exposure records will be made available, on request, to authorized OSHA representatives to examine and copy.
- e. Regarding exposure records, if no such records exist for the employee making written request, NSE will provide records (if such exist) of other employees who have job duties/environment similar to those of the requesting employee. Medical records relevant to the employee requesting access will be provided to this employee, their designated representative, or to authorized representatives of OSHA, under guidelines and provisions contained in 1910.1020(e)(2)(ii). Access to the medical records of another employee will be provided **ONLY** if specific written consent can be obtained from that employee.
- f. The employee requesting access, their designated representative, or OSHA will also have access to analyses (if any such exist) that were developed using information from exposure or medical records about the employee's working conditions or workplaces. Personal identities, such as names, addresses, social security and payroll numbers, age, race and sex will be removed from the data analyses prior to access.
- g. A copy of 29 CFR 1910.1020 is maintained by NSE for general reference and review by employees. It is available to any employee upon request.

8. SAFETY & HEALTH SELF-INSPECTIONS

NSE has implemented a process to identify, correct and control hazards on an ongoing basis.

- a. Supervisors in each division and job site will conduct scheduled "in-house" safety and health self-inspections at least monthly in their area(s) of responsibility. Inspections will include, but will not be limited to: any tools, equipment, and machinery, operating procedures and any existing and/or potential hazards on the work site, or working conditions that are unsanitary, hazardous or dangerous to employees.
- b. Each division/location will develop and maintain one or more self-inspection checklists specific to its operation. The list will be developed utilizing a general inspection checklist and will be evaluated and updated with hazards that are identified during the inspections, and from other pertinent data (injury reports, "near misses," employee observations and suggestions) as such information is acquired.
- c. Contents of checklists will be reviewed on a regular basis to ensure that they are current and updated. Checklists will become a part of the permanent record of the inspection and will serve as one confirmation of the self-inspection.

- d. Each checklist will indicate the location or specific site or area surveyed, name and title of the inspector, date and time of the inspection, corrective action(s) taken for specific hazards or violations, and specific person(s) either initially informed or assigned to make sure that corrective actions are effectively implemented.
- e. The self-inspection report will be forwarded to the Safety Director for use in trend analysis and recordkeeping.
- f. Employees will be notified of any hazard that poses an immediate threat of physical harm or property damage, and be informed of measures or steps taken to eliminate, correct or control the hazard.
- g. The Safety Director will review self-inspection checklists to confirm that any required corrective action has been completed.

9. **INCIDENT REPORTING & INVESTIGATIONS**

NSE will investigate all work-related incidents and near miss incidents involving employees or other persons; or significant damage to NSE and customer property. This investigation will be used to develop preventive measures and implement corrective actions.

- a. All employees are required to report any of the following to their immediate supervisor as quickly as possible and without delay:
 - $\frac{3}{4}$ Incidents resulting in injury or illness of any magnitude (including first aid related cases)
 - $\frac{3}{4}$ Incidents resulting in significant property or equipment damage; and
 - $\frac{3}{4}$ Any near miss incidents that could potentially have resulted in injury or illness to an employee, or damage to property
- b. The supervisors will be responsible for conducting incident investigations that occur in areas that affect employees under their supervision. Upon notification of an incident or near miss incident, the Safety Director, or someone the Safety Director may designate, will begin an investigation to determine the following:
 - $\frac{3}{4}$ How the incident occurred
 - $\frac{3}{4}$ Special circumstances involved
 - $\frac{3}{4}$ Underlying, indirect or associated causes; and
 - $\frac{3}{4}$ Corrective actions or preventive measures and controls indicated by investigation results

- c. Incidents involving situations where multiple supervisors are affected, such as an employee of one area injured in another area, will be investigated as a joint effort directed and overseen by the Safety Director.

10. INCIDENT DOCUMENTATION

- a. All activities and findings of the investigations will be documented and recorded for review by the Safety Director.
- b. Incident investigation documentation will record, as a minimum, the following information:
 - $\frac{3}{4}$ Date of occurrence
 - $\frac{3}{4}$ Name of person(s) involved, job title, area assigned and length of experience in NSE with this job
 - $\frac{3}{4}$ Location of occurrence
 - $\frac{3}{4}$ Nature and severity of injury or illness
 - $\frac{3}{4}$ Name of Supervisor(s) involved in the investigation
 - $\frac{3}{4}$ Job assignment or duties being performed at time of incident
 - $\frac{3}{4}$ A list of any Personal Protective Equipment and/or operator certification(s) required for this job or assignment, and whether the person(s) involved were using this PPE and/or held current certifications as required
 - $\frac{3}{4}$ Special circumstances or encumbrances
 - $\frac{3}{4}$ Details of how the incident occurred
 - $\frac{3}{4}$ Equipment affected or involved
 - $\frac{3}{4}$ Written statements of the person(s) injured or directly involved (unless unavailable due to injury)
 - $\frac{3}{4}$ Names and written statements of witnesses
 - $\frac{3}{4}$ Apparent direct cause
 - $\frac{3}{4}$ Apparent indirect, underlying or contributing factors (including fault or failure in Safety & Health Process elements); and

- ¾ Corrective action(s) implemented or preventive measures taken (including Safety & Health Process adjustments)

11. INCIDENT ANALYSIS & REVIEW

- a. NSE management and the Safety Director will periodically review and analyze records and documentations pertaining to ongoing implementation of the Safety & Health Process, incidents and near miss incidents. This review will focus on hazard analysis and recognition of any developing trends.
- b. Trend analysis will identify recurring incidents and near miss incidents resulting in, or potentially involving injury, illness or property damage. The analysis also will be used to identify deficiencies in process components so that enhancements can be made as needed.
- c. This process will include review of employee training records to ensure that new hire and safety procedures training are being accomplished in accordance with NSE requirements.

12. ORIENTATION & TRAINING

- a. NSE will provide initial safety and health orientation and related ongoing training to employees at all levels of the organization.
 - ¾ The Safety Director will develop, implement and maintain the safety and health orientation and training processes. These are intended to educate and familiarize employees with safety and health procedures, rules and safe work practices established for NSE operations.
 - ¾ Management will encourage and require participation of all employees. Management will support the safety orientation and training processes with sufficient allocations of time and funding for effective implementation.
- b. Safety and health orientations and training will be developed to inform employees about:
 - ¾ Potential hazards associated with the work area
 - ¾ Potential hazards associated with specific job or task assignments
 - ¾ Emergency procedures
 - ¾ Personnel Protective Equipment (PPE) required for specific tasks or assignments
 - ¾ Hazard Communication Standard (Right-to-Know) information about chemicals used in the workplace
 - ¾ Specific equipment operations training related to employee tasks or job assignments

- ¾ NSE safety rules and safe work procedures
 - ¾ Employee reporting requirements regarding safety hazards, incidents and near miss incidents
 - ¾ Incident investigation procedures and requirements; and
 - ¾ Personnel health monitoring requirements as applicable to a task or job assignment
- c. Employee safety and health training will be implemented in three ways:
- ¾ New Hire Safety & Health Orientation
 - ¾ Reassigned Personnel Safety and Health Orientation; and
 - ¾ Ongoing / Annual Safety & Health Training
- d. New Hire Safety & Health Orientation:
- ¾ New Hire Safety Orientation Training will be administered to all new employees prior to the initial work assignment. The orientation will consist of all required training processes as well as job and site-specific safety and health information.
 - ¾ New Hire Orientation includes an overview of the Safety & Health Process, plus explanation of Individual Employee Safety Responsibilities; the written Hazard Communication Standard (Right-to-Know) Process; General Safe Working Procedures; Job-Specific and Site-Specific Safety and Health Procedures (including special training about NSE and customer safety and safe work procedures); Fire Extinguisher Training and Emergency Response Procedures.
 - ¾ All New Hires will be given a tour of the facility/job site and an opportunity to pose questions to the Safety Director or Supervisor as needed to help the new employee understand safety and health information, rules, policies and procedures.
- e. Reassigned Personnel Safety & Health Orientation
- ¾ Personnel who are given a new work assignment will receive an orientation on safety rules and safe work procedures relating to these new duties.
 - ¾ This is referred to as the ***REASSIGNED PERSONNEL SAFETY ORIENTATION***. In addition to job specific safety training, reassigned personnel will receive information/training on the chemical hazards and emergency procedures for the reassigned work area.

f. Ongoing Safety & Health Training:

Employees will participate and be involved in ongoing safety and health training at NSE. This type of activity provides both refresher training and reinforcement of safe work procedures. It also helps communicate new information and general safety awareness.

g. Annual Safety & Health Training:

³/₄ Annual training and recertification training will be developed and/or reviewed by the Safety Director. Annual training topics may include, but may not be limited to the following:

- Hazard Communication
- Proper Selection and Use of Personal Protective Equipment
- Responding to Injuries and Illnesses at Work – First Aid and CPR Options
- Bloodborne Pathogens Awareness
- Fire Safety, Prevention and Response
- Electrical Safety
- Control of Hazardous Energy – Lockout and Tagout
- Emergency Response, Evacuation and Shelter In Place Procedures
- Housekeeping for Safety / Safe Walking and Working Surfaces
- Material Handlings / Preventing Back Injuries
- Machine Guarding and Safe Operations of Powered Equipment
- Ergonomics in NSE Workplace
- Preventing Violence In The Workplace
- Heat Related Illnesses
- Stairs and Ladder Safety / Fall Protection
- Office Safety

h. Documentation of Training:

- ¾ The Safety Director will maintain a written record of safety training taken by each employee during the year.
- ¾ Employee safety and health training will be documented with at least the following information:
 - Date of training session
 - Provider (name of person conducting training and affiliation, if not an employee of NSE)
 - Subject matter
 - Legible name of attendee(s) and supplemental identification if needed or required
 - Printed name and signature of employee as acknowledgment of attendance
- ¾ Individual training records will be maintained for the duration of employment plus three years.

i. Concepts About General Safety & Specific Duty Training:

- ¾ The Safety & Health Process is designed to provide detailed information to employees about NSE's safety related policies, as well as to serve as a training guide and reference source. The process presents **GENERAL SAFETY TRAINING** to employees about health and safety subject matter that pertains to all NSE operations.
- ¾ Job-specific or task-specific safety and health orientation is presented as **SPECIFIC DUTY TRAINING**. It is provided to employees who are assigned to work in jobs or at tasks that require specialized safety/health knowledge, understanding and proficiency.
- ¾ Examples of these types of assignments include operation of heavy equipment, cranes and hoists; forklift operator safety training and certification; performance of lockout and tagout procedures for authorized persons; excavation safety training and certification; confined space entry safety training and certification; powered equipment and tools; and vehicle operations when in the course and scope of employment with NSE.
- ¾ Employees will receive both types of training before they begin a job assignment.

13. RECORDKEEPING

- a. NSE believes that the only valid means of reviewing and identifying trends and deficiencies in a safety process is through an effective Recordkeeping Process. The

recordkeeping element is also essential in tracking the performance of duties and responsibilities under the process.

- b. NSE is committed to implementing and maintaining an active, up-to-date Recordkeeping Process. Therefore, all documents and records applicable to NSE will be submitted and maintained on file for verification purposes at the address given below:

NextSun Energy, LLC Attn:
PO Box 974
Edwards, CO 81632

- c. NSE will document and maintain records of safety and health related employee training. This documentation will be maintained as proof of attendance and for review to assist in determining the need for additional or recurring training for employees on an individual basis.
- d. The Safety Director shall maintain records of all work-related employee injuries and illnesses. The following records are applicable only to work-related injuries and illnesses:
 - $\frac{3}{4}$ OSHA 300 Log or Recordable Injuries and Illnesses, or equivalent if required
 - $\frac{3}{4}$ OSHA 301 Injury and Illnesses Incident Report, or equivalent if required
 - $\frac{3}{4}$ OSHA 300A Summary of Work-Related Injuries and Illnesses, or equivalent if required; and
 - $\frac{3}{4}$ State workers' compensation and insurance carrier forms (as appropriate):
 - The OSHA 300 Log, an Annual Log of Recordable Injuries and Illnesses, or an equivalent record, shall be maintained at each job site for not less than five (5) years. The OSHA 301 Injury and Illness Incident Report, or an acceptable equivalent, shall be established bearing a case number correlating with the case identifier on the OSHA 300 Log and all pertinent and required information. The information contained or entered on these records shall be made current within six working days of a recordable incident.
 - A copy of the completed and signed OSHA 300 annual summary must be posted in each establishment in a conspicuous place or places where notices to Employees are customarily posted. NSE shall ensure that the posted annual summary is not altered, defaced or covered by other material.
 - The completed and signed OSHA 300 annual summary shall be posted no later than February 1 of the year following the year covered by the records. The posting shall remain in place until April 30.
- e. Safety & Health Surveys & Inspections/Process Evaluations

- ¾ NSE will maintain and review records of all safety audits and inspections that are conducted within or that affect NSE, our Employees or facilities. Applicable forms and records:
 - Comprehensive surveys reports and records of action(s) taken; and
 - Documented checklists of self-inspections and records of action(s) taken
- ¾ Documentation will also show the date corrections were made or action(s) taken. These reports and all associated documentation will be maintained for record and periodic review to ensure hazard corrections and implemented recommendations are maintained
- ¾ A checklist will be developed as part of the periodic self-inspection process. This checklist will be utilized and completed including the name of the person performing the evaluation and the date the inspection takes place
- ¾ The self-inspection checklist will be reviewed by management and supervisors upon completion. All discrepancies identified during the survey will be evaluated as soon as possible. The periodic self-inspection checklist will be reviewed and evaluated on a regular basis to ensure current applicability
- ¾ This review will be performed with input from supervisors and employees from each division. The checklist will be retained along with other applicable data for review
- ¾ The formal Incident Prevention Plan components will be reviewed annually to identify insufficiencies or component failure. Each component will be audited individually with the findings documented and recorded. This documentation will be utilized to identify trends in the process element deficiency and to track improvement modifications. This documentation will be maintained for review
- f. NSE will maintain records of in accordance with the *Safety & Health Process*. This includes applicable forms, logs and records contained in or required by the process. These records will be maintained by the Safety Director.
- g. NSE will maintain records and documentation of incident investigations. Applicable forms and records include:
 - ¾ Incident investigation forms and supporting data including photographs, drawings, diagrams, videotapes and audio-taped recordings; and
 - ¾ Records of corrective action(s) or preventive measures implemented.
- h. NSE will maintain records and data pertaining to equipment and maintenance processes. Applicable forms and records are:
 - ¾ Routine inspection and maintenance records;

- ¾ Documentation of services performed by contract agreement; and
- ¾ Documentation of repair and replacement of parts or equipment.

14. PERIODIC REVIEW & REVISION OF PROCESS ELEMENTS

- a. At least annually, the Safety Director, management and other designated NSE personnel will review and revise the components of the Incident Prevention Plan and the Safety & Health Process for effective implementation.
- b. Specific attention will be devoted to the introduction of new procedures, processes and equipment, as well as indications that a process component needs revision or updating.
- c. Information for this review process will be solicited from supervisors and employees.

AERIAL WORK PLATFORMS

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Scope

Equipment covered

Employer and employee responsibility

Definitions

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Inspection; maintenance; testing

Permits; training

Preoperational procedures

Electrical hazards

Vehicles; traffic control

Fall protection

Operating procedures

Figures

Scope.

These rules apply to the construction, operation, maintenance, and inspection of aerial work platforms with either manual or powered mobility as used in construction operations.

Equipment covered.

1. These rules apply to equipment that has a primary function of elevating personnel, together with their tools and necessary materials, on a platform, which is mechanically positioned.
2. Equipment adapted to elevating personnel with a primary function other than elevating personnel, such as fork trucks or cranes, are not covered by these rules.

Employer responsibility.

1. Provide training to employees in the operations, hazards, safeguards and safe practices described in these rules by a qualified person.
2. Ensure that employees do not engage in the activities to which these rules apply until such employees have received training.
3. Maintain an aerial device in a condition free of known defects and hazards which could cause an injury.

Employee Responsibility:

1. Operate an aerial device only after being trained in the operations, hazards, safeguards and safe practices required by these rules by a qualified person and authorized by the employer.
2. Report known defects and hazards concerning an aerial device to the supervisor.

Definitions.

Aerial device or "aerial work platform" means an entire device that is designed and manufactured to raise personnel to an elevated work position on a platform supported by scissors, masts, or booms.

Aerial ladder means an aerial device that consists of a single- or multiple-section rung

ladder.

Articulating boom means an aerial device that has two 2 or more hinged boom sections.

Authorized person means a person who is approved and assigned to perform specific types of duties by the employer and who is qualified to perform those duties because of his or her training or experience.

Commercial chassis means a vehicle that is built for over-the-road (roadway) travel.

Exposed power line means a power line that is not isolated or guarded.

Extensible boom means an aerial device, except for the aerial ladder-type, that has a telescopic boom.

Insulated aerial device means an aerial work platform that is designed with dielectric components to meet specific electrical insulating ratings.

Mechanically positioned means that the elevating assembly, whether a mechanical (cable or chain), hydraulic, pneumatic, electric or other powered mechanism, is used to raise or lower the platform.

Platform means the portion of an aerial work platform, such as a bucket, basket, stand, cage, or the equivalent, that is designed to be occupied by personnel.

Power Line means a distribution or transmission electrical line.

Qualified person means a person who possesses a recognized degree, certificate, professional standing, or skill and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems relating to the subject matter, the work, or the project.

Qualified telecommunications employee means an employee trained to work on communication lines in the proximity of energized power transmission and distribution lines.

Vehicle means any carrier that is not manually propelled.

Vehicle-mounted elevating and rotating work platform means an aerial device or aerial work platform.

Vertical tower means an aerial device that is designed to operate vertically on a level surface.

Construction.

1. Aerial work platforms shall be designed, constructed, and tested so as to be in compliance with the required standards.
2. Aerial work platforms shall not be field-modified for uses other than those intended by the manufacturer, unless the modification has been certified in writing by the manufacturer or by any other equivalent entity.
3. Directional controls shall be in compliance with all of the following provisions:
 - a. Be of the type that will automatically return to the off or neutral position when released.
 - b. Be protected against inadvertent operation.
 - c. Be clearly marked as to their intended function.
 - d. An overriding control shall be provided in the platform which must be continuously activated for platform directional controls to be operational and which automatically returns to the off position when released.
4. Aerial work platforms shall be equipped with emergency controls at ground level.
5. Emergency ground level controls shall be clearly marked as to their intended function and be capable of overriding the platform controls.

6. All of the following information shall be clearly marked in a permanent manner on each aerial work platform:
 - a. Special workings, cautions, or restrictions necessary for operation.
 - b. Rated work load.
 - c. A clear statement of whether or not the aerial work platform is electrically insulated.
7. Rotating shafts, gears, and other moving parts that are exposed to contact shall be guarded.
8. Attachment points shall be provided for fall protection devices for personnel who occupy the platform on aerial work platforms.

Inspection; maintenance; testing.

1. Each aerial work platform shall be inspected, maintained, repaired, and kept in proper working condition in accordance with the manufacturer's or owner's operating or maintenance and repair manual or manuals.
2. Any aerial work platform found not to be in a safe operating condition shall be removed from service until repaired. All repairs shall be made by an authorized person in accordance with the manufacturer's or owner's operating or maintenance and repair manual or manuals.
3. If the aerial work platform is rated and used as an insulated aerial device, the electrical insulating components shall be tested for compliance with the rating of the aerial work platform.

Permits; training.

1. NSE shall provide the operator of an aerial work platform with an aerial work platform permit.
2. A permit shall be carried by the operator or be available at the jobsite.
3. A permit shall indicate the type of aerial work platforms an operator has been trained on and is qualified to operate.
4. A permit to operate an aerial work platform is valid only when performing work for the employer who issued the permit. A permit shall be issued for a period of not more than 3 years.

Preoperational procedures.

1. An operator shall inspect an aerial work platform for defects that would affect its safe operation and use before it is used on each work shift. The visual inspection shall check for the following:

Visual inspection for all of the following:

- Cracked welds.
- Bent or broken structural members.
- Hydraulic or fuel leaks.
- Damaged controls and cables.
- Loose wires.
- Tire condition.
- Fuel and hydraulic fluid levels.
- Slippery conditions on the platform.

2. Operate all platform and ground controls to ensure that they perform their intended function.
3. Before the aerial work platform is used, and during use on the job site, the operator shall inspect for all of the following:
 - Ditches.
 - Drop-offs.
 - Holes.
 - Bumps and floor obstructions.
 - Debris.
 - Overhead obstructions.
 - Power lines.
4. All unsafe items found as a result of the inspection of the aerial work platform or work area shall be corrected before further use of the aerial work platform.
5. Any overhead wire shall be considered to be an energized line until the owner of the line, his or her authorized representative, or a utility representative assures one of the following:
 - a. The line is de-energized and has been visibly grounded.
 - b. The line is insulated for the system voltages and the task will not compromise the insulation of the conductor and/or cause an electrical hazard.

Electrical hazards.

1. The employer shall ensure that an aerial work platform shall be operated so that the distances from energized power lines and equipment prescribed in Table 1 are maintained, except for the following:
 - a. As prescribed in subrule (2) of this rule addressing tree trimming.
 - b. As prescribed in subrule (3) of this rule addressing telecommunications.
 - c. Where insulating barriers are not a part of or an attachment to the aerial device that has been erected to prevent physical contact with the lines.
2. A qualified lineman or a qualified line clearance tree trimmer shall maintain distances as prescribed in Table 2 when performing work from an aerial work platform on or near an exposed power line unless any of the following conditions exist:
 - a. The employee is insulated or guarded from the energized part by gloves or gloves and sleeves.
 - b. The employee is insulated, isolated, or guarded from any other conductive part.
 - c. The energized part is insulated from the employee.
3. A qualified telecommunications employee shall maintain the distances prescribed in Table 3 when working from an aerial lift, unless the employee is insulated, isolated, or guarded from any other conductive part or the energized part is insulated from the employee.
4. Employees shall use insulated bucket, gloves and sleeves that are rated at more than the voltage to be worked on or that with which they might come into contact, to comply with subrules (2) and (3) of this rule.
5. The clearances, as prescribed in Tables 1-3, do not apply when the owner of the line or his or her authorized representative, or a utility representative assures that the conductor is insulated for the system voltages and the task will not compromise the insulation of the conductor and/or cause an electrical hazard.

6. Tables 1, 2, and 3 read as follows:

Table 1		
Minimum Clearance Distances for Equipment		
Voltage	Clearance With Boom Raised	Clearance Boom Lowered and No Load in Transit
To 50 kV	10 feet	4 feet
Over 50 kV	10 feet + .4 inch per each 1 kV over 50 kV	10 feet
50 to 345 kV	--	10 feet
346 to 750 kV	--	15 feet

Table 2	
Minimum Working Distances for Qualified Line-Clearance Tree Trimmers and Qualified Linemen	
Voltage Range Phase to Phase (kilovolts)	Minimum Working Distance
2.1 to 15.0	2 feet 0 inches (61 cm)
15.1 to 35.0	2 feet 4 inches (71 cm)
35.1 to 46.0	2 feet 6 inches (76 cm)
46.1 to 72.5	3 feet 0 inches (91 cm)
72.6 to 121.0	3 feet 4 inches (102 cm)
138.0 to 145.0	3 feet 6 inches (107 cm)
161.0 to 169.0	3 feet 8 inches (112 cm)
230.0 to 242.0	5 feet 0 inches (152 cm)
345.0 to 362.0	*7 feet 0 inches (213 cm)
550.0 to 552.0	*11 feet 0 inches (335 cm)
700.0 to 765.0	*15 feet 0 inches (457 cm)

*Note: For 345-362 kV., 500-552 kV., and 700-765 kV., the minimum working distance and the minimum clear hot stick distance may be reduced that such distances are not less than the shortest distance between the energized part and a grounded surface.

**Table 3
Minimum Approach Distances for
Qualified Telecommunications Employees**

Voltage Range (Nominal Phase to Phase)	Minimum Approach Distances
300 V and less	1 foot - 0 inches (30.5 cm)
Over 300 V, not over 750 V	1 foot - 6 inches (46 cm)
Over 750 V, not over 2 kV	2 feet - 0 inches (61 cm)
Over 2 kV, not over 15 kV	3 feet - 0 inches (91 cm)
Over 15 kV, not over 37 kV	3 feet – 6 inches (107 cm)
Over 37 kV, not over 87.5 kV	4 feet – 0 inches (122 cm)
Over 87.5 kV, not over 121 kV	4 feet – 6 inches (137 cm)
Over 121 kV, not over 140 kV	--

Vehicles; traffic control.

1. Before moving a vehicle supporting an aerial ladder for highway travel, employees shall secure ladders in the lower position and shall use the manually operated device at the base of the ladder, or other effective means to prevent elevation or rotation of the ladder.
2. Before moving a vehicle supporting an aerial lift for travel, employees shall inspect the boom to ensure that it is properly cradled and the outriggers are in the stowed position, except as provided in subrule (3) of this rule.
3. When a boom is elevated with employees in working position, the vehicle supporting an aerial device shall not be moved unless the equipment is specifically designed for this type of operation.
4. Before and during travel an operator shall do all of the following:
 - Inspect to see that booms, platforms, aerial ladders, or towers are properly cradled or secured.
 - Ensure that outriggers are in a stored position.
 - Limit travel speed according to the following factors:
 - Condition of the surface.
 - Congestion.
 - Slope.
 - Location of personnel.
 - Other hazards.
5. An employer shall ensure that operators of an aerial work platform over or adjacent to any public or private roadway maintain adequate clearances of all portions of the aerial work platform to prevent being struck by vehicular traffic.
6. When aerial work platforms are in use, all traffic control requirements shall be in compliance.

Fall protection.

1. NextSun Energy shall provide a safety harness that has a lanyard which is in compliance with construction safety standard.
2. An employee may use a body belt with a restraint device with the lanyard and the anchor arranged so that the employee is not exposed to any fall distance. An employee shall use a restraint device where the aerial lift cannot withstand the vertical and lateral loads imposed by an arrested fall.
3. An employee shall be prohibited from belting off to an adjacent pole, structure, or equipment while working from an aerial work platform.
4. NextSun Energy shall not allow employees to exit an elevated aerial work platform, except where elevated work areas are inaccessible or hazardous to reach. Employees may exit the platform with the knowledge and consent of the employer. When employees exit to unguarded work areas, fall protection shall be provided and used as required.

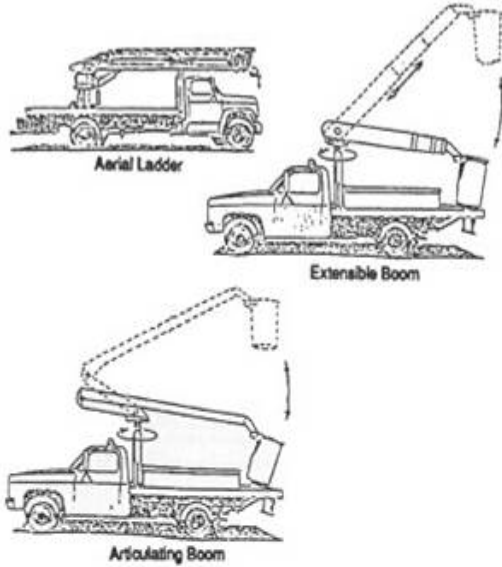
employees are able to rescue themselves.

Operating procedures.

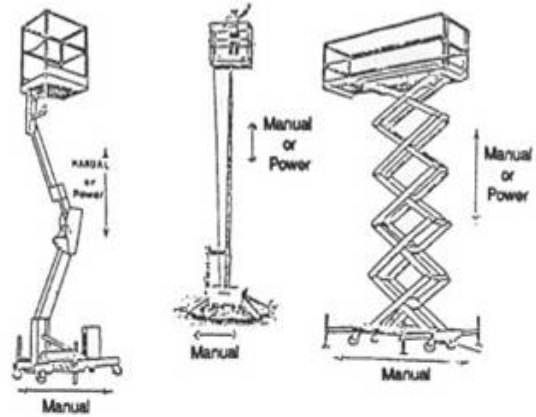
1. The aerial work platform shall be used only in accordance with the manufacturers or owners operating instructions and safety rules.
2. The designed rated capacity for a given angle of elevation shall not be exceeded.
3. Proximity warning devices may be used, but shall not be used to avoid meeting the requirements of this rule.
4. The manufacturer's rated load capacity shall not be exceeded. The employer shall ensure that the load and its distribution on the platform are in accordance with the manufacturer's specifications. The aerial work platform rated load capacity shall not be exceeded when loads are transferred to the platform at elevated heights.
5. Only employees, their tools, and necessary materials shall be on or in the platform.
6. The guardrail system of the platform shall not be used to support any of the following:
 - a. Materials.
 - b. Other work platforms.
 - c. Employees.
7. Employees shall maintain firm footing on the platform while working on the platform. The use of railings, planks, ladders, or any other devices on the platform for achieving additional height is prohibited.
8. Fuel gas cylinders shall not be carried on platforms that would allow the accumulation of gases.
9. Only aerial work platforms that are equipped with a manufacturer's installed platform controls for horizontal movement shall be moved while in the elevated position.
10. Before and during driving while elevated, an operator of a platform shall do both of the following:
 - a. Look in the direction of, and keep a clear view of, the path of travel and make sure that the path is firm and level.
 - b. Maintain a safe distance from all of the following:
 - Obstacles.
 - Debris.
 - Drop-offs.
 - Holes.
 - Depressions.
 - Ramps.
 - Overhead obstructions.
 - Overhead electrical lines.
 - Other hazards to safe elevated travel.
11. Outriggers or stabilizers, when provided, and are to be used in accordance with the manufacturer's instruction. Brakes shall be set and outriggers and stabilizers shall be positioned on pads or a solid surface.
12. Aerial work platforms shall be elevated only when on a firm and level surface or within the slope limits allowed by the manufacturer's instructions.
13. A vehicle-mounted aerial work platform (figure 1) shall have its brakes set before elevating the platform.
14. A vehicle-mounted aerial work platform (figure 1) shall have wheel chocks installed before using the unit on an incline.
15. Climbers shall not be worn while performing work from an aerial work platform.
16. Platform gates shall be closed while the platform is in an elevated position.
17. Altering, modifying, or disabling safety devices or interlocks is prohibited.
18. Care shall be taken by the employer to prevent ropes, cords, and hoses from becoming entangled in the aerial work platform.
19. A platform operator shall ensure that the area surrounding the aerial work platform is clear of personnel and equipment before lowering the platform.
20. The aerial work platform shall not be positioned against another object to steady the platform.
21. The aerial work platform shall not be operated from a position on a truck, trailer, railway car, floating vessel, scaffold, or similar equipment.
22. The boom and platform of the aerial work platform shall not be used to move or jack the wheels off the ground unless the machine is designed for that purpose by the manufacturer.
23. If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by adjacent structures or other obstacles so that control reversal does not free the platform, all employees shall exit from the platform before attempts are made to free the platform.
24. Stunt driving and horseplay are prohibited.

Figures.
Figures 1 to 4 are as follows:

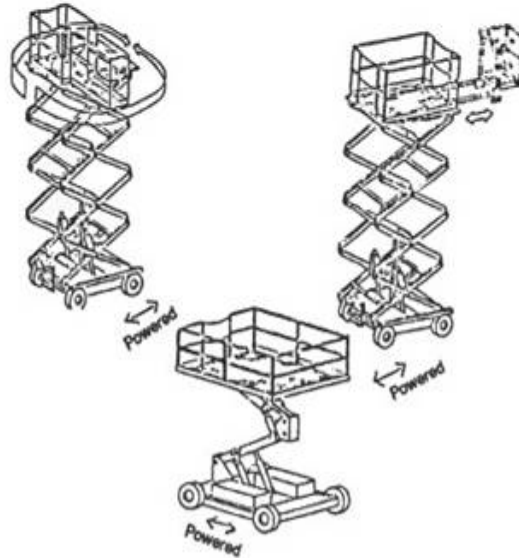
**FIGURE 1
VEHICLE-MOUNTED ELEVATING WORK PLATFORMS**



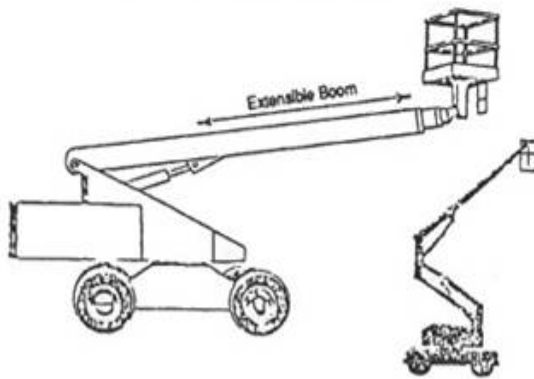
**FIGURE 2
MANUALLY PROPELLED ELEVATING WORK PLATFORMS**



**FIGURE 4
SELF-PROPELLED ELEVATING WORK PLATFORMS**



**FIGURE 3
BOOM-SUPPORTED ELEVATING WORK PLATFORMS**



NEXTSUN ENERGY, LLC

Asbestos Process

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NEXTSUN ENERGY, LLC

Asbestos Awareness & Safety Process

a. PURPOSE

The purpose of this process is to comply with the OSHA standards, to make employees of NextSun Energy, LLC aware of asbestos, and to prevent exposure to asbestos at the jobsite. This Process does *NOT* provide the necessary or required training to personnel to perform asbestos work for which state and other regulatory licensing requirements apply.

b. SCOPE

This Asbestos awareness process applies to:

- a. NextSun Energy, LLC (NSE)
- b. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NSE management
- c. All NSE, contractors, sub contractors, their workers and suppliers, while working under NSE contracts

c. REFERENCE

(a) 29 CFR 1926.1101

(b) 29 CFR 1910.1001

4. INTRODUCTION

Throughout history, asbestos has provided a durable readily adaptable heat and fire retardant agent conforming readily to industrial and architectural design aesthetics. It has been utilized in the fabrication of construction materials, including pipe and boiler insulation, wallboard and transite siding, insulation board, roofing felt, spray on ceiling and wall applications, acoustical plaster and ceiling tiles, floor tiles, textile wall coverings and specialty cement.

In the late 1970s, however, numerous clinical studies clearly linked asbestos exposure with such diseases as lung and colon cancer, asbestosis and mesothelioma. As a result EPA and OSHA prescribed regulations in 1983 and again in 1986 specifying work practices and rules

governing the handling and disposal of asbestos-containing material, restricting the use of asbestos products in new buildings and establishing minimum employee exposure levels.

This document is intended to give the user an awareness level of the rules and regulations of Asbestos Abatement processes and procedures.

5. NOTIFICATIONS

- a. Before an asbestos abatement project begins, determination will be made of state, local agency and environmental regulatory notifications that are required for such work. Generally, such notifications include reporting of the date that an asbestos abatement project is going to start and when it is expected to be completed. There may be deadlines for submitting such notifications and mandatory requirements prior to and during the conduct of such work. Confirmation also will be made that the conduct of any such work complies with applicable state and other regulatory requirements for personnel licensing, certification, training and other specifications.
- b. The responsibility for notification lies with the facility owner. This does not relieve the contractor of the responsibility to ensure it has been done.
- c. There may be instances in which an emergency notification is allowed. Generally, regulatory agencies will not consider poor planning an emergency. Exposure situations or catastrophic incidents are more likely to be approved. Remember, what constitutes an emergency is subjective.

6. QUALIFIED PERSONNEL AND LICENSING

- (a) Licensing: Prior confirmation will be made of applicable state licensing and/or other regulatory requirements for an individual performing work as an asbestos contractor. There may be different or additional requirements for a competent person or workers if they are in an industrial facility.
- (b) Competent Person: Also known as an asbestos supervisor, this individual must complete a 40-hour course provided by an EPA accredited institution. Additionally, competent persons may be required by the state or applicable local regulatory authority to be licensed to perform such work.
- (c) Trained Worker: All asbestos workers must complete a 32-hour course provided by an EPA accredited institution. The state or applicable local regulatory authority may also require that these individuals be licensed to perform such work.

7. EMPLOYEE INFORMATION & TRAINING

- (a) NSE shall institute a training process for all employees who are exposed to airborne concentrations of asbestos at or above the PEL and/or excursion limit and ensure their participation in the process.

- (b) Training shall be provided prior to or at the time of initial assignment and at least annually thereafter.
- (c) The training process shall be conducted in a manner which the employee is able to understand. NSE shall ensure that each employee is informed of the following:
 - (1) Health effects associated with asbestos exposure
 - (2) Relationship between smoking and exposure to asbestos producing lung cancer
 - (3) Quantity, location, manner of use, release, and storage of asbestos, and the specific nature of operations which could result in exposure to asbestos
 - (4) Engineering controls and work practices associated with the employee's job assignment
 - (5) Specific procedures implemented to protect employees from exposure to asbestos, such as appropriate work practices, emergency and clean-up procedures, and personal protective equipment to be used
 - (6) Purpose, proper use, and limitations of respirators and protective clothing, if appropriate
 - (7) Purpose and a description of the medical surveillance process required by section (15)
 - (8) Content of this standard, including appendices
 - (9) Names, addresses and phone numbers of public health organizations which provide information, materials, and/or conduct processes concerning smoking cessation
 - (10) Requirements for posting signs and affixing labels, and the meaning of the required legends for such signs and labels
- (d) NSE shall also provide, at no cost to employees who perform housekeeping operations in an area that contains ACM or PACM, an asbestos awareness training course. The employees shall be trained at least annually and at a minimum the course will contain the following elements:
 - (1) Health effects of asbestos
 - (2) Locations of ACM and PACM in the building/facility
 - (3) Recognition of ACM and PACM damage and deterioration
 - (4) Requirements in this standard relating to housekeeping, and

- (5) Proper response to fiber release episodes, to all employees who perform housekeeping work in areas where ACM and/or PACM are present
- (e) A written certificate of training shall be provided to each employee who successfully completes the training as specified in this process. Copies of the certificates of training shall be maintained as documentation.

8. ACCESS TO INFORMATION AND TRAINING MATERIALS

- (a) NSE shall make a copy of this standard and its appendices readily available without cost to all affected employees.
- (b) NSE shall provide, upon request, all materials relating to the employee information and training process to the Assistant Secretary and the training process to the Assistant Secretary and the Director.
- (c) NSE shall inform all employees concerning the availability of self-help smoking cessation process material. Upon employee request, NSE shall distribute such material, consisting of NIH Publication No. 89-1647, or equivalent self-help material.

9. PERMISSIBLE EXPOSURE LIMITS (PELs) & EXPOSURE MONITORING

- (a) Time-Weighted Average (TWA): NSE shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fibers per cubic centimeter of air as an 8-hour TWA as determined by the method prescribed in Appendix A of 1910.1001, or by an equivalent method.
- (b) Excursion Limit: NSE shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of 30 minutes as determined by accepted methods.
- (c) Exposure Monitoring: Determinations of employee exposure shall be made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee.
- (d) Representative 8-hour TWA employee exposures shall be determined on the basis of one or more samples representing full-shift exposures for each shift for each employee in each job classification in each work area.
- (e) Representative 30-minute short-term employee exposures shall be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for each shift for each job classification in each work area.
- (f) NSE shall establish regulated areas wherever airborne concentrations of asbestos and/or PACM are in excess of the TWA and/or excursion limit.

10. ENGINEERING CONTROLS & WORK PRACTICES

- (a) NSE shall institute engineering controls and work practices to reduce and maintain employee exposure equal to or below the TWA and/or excursion limit except to the extent that such controls are not feasible.
- (b) Wherever the feasible engineering controls and work practices that can be instituted are not sufficient to reduce employee exposure equal to or below the TWA and/or excursion limit, NSE shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of this process and NSE's Respiratory Protection Process.
- (c) For the following operations, wherever feasible engineering controls and work practices that can be instituted are not sufficient to reduce the employee exposure equal to or below the TWA and/or excursion limit, NSE shall use them to reduce employee exposure to or below 0.5 fiber per cubic centimeter of air (as an 8-hour TWA) or 2.5 fibers/cc for 30 minutes (short-term exposure) and shall supplement them by the use of any combination of respiratory protection, work practices and feasible engineering controls that will reduce employee exposure to or below the TWA and to or below the excursion limit permissible: Coupling cutoff in primary asbestos cement pipe manufacturing; sanding in primary and secondary asbestos cement sheet manufacturing; grinding in primary and secondary friction product manufacturing; carding and spinning in dry textile processes; and grinding and sanding in primary plastics manufacturing.
- (d) Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with good practices such as those found in the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1979.
- (e) All hand-operated and power-operated tools which would produce or release fibers of asbestos, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems which comply with paragraph (d) of this section.
- (f) Regarding *wet methods*, insofar as practicable, asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers so as to expose employees to levels in excess of the TWA and/or excursion limit, unless the usefulness of the product would be diminished thereby.
- (g) To effectively prevent the release of airborne fibers, no asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos, shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, enclosed, or ventilated.

(h) Compressed air shall not be used to remove asbestos or materials containing asbestos unless the compressed air is used in conjunction with a ventilation system which effectively captures the dust cloud created by the compressed air.

(i) Sanding of asbestos-containing flooring material is prohibited.

11. REQUIREMENT FOR WRITTEN PROCESS

(a) During work and where the TWA and/or excursion limit for asbestos is exceeded, NSE shall establish and implement a written process to reduce employee exposure equal to or below the TWA or the excursion limit by means of engineering and work practice controls, and by the use of respiratory protection where required or permitted under this section.

(b) The hazards of exposure to asbestos shall be communicated to employees who have such an exposure as part of their work. Asbestos exposure in general industry and construction occurs in a wide variety of industrial and commercial settings. Employees who manufacture asbestos-containing products may be exposed to asbestos fibers. Employees who repair and replace automotive brakes and clutches may be exposed to asbestos fibers.

(c) In addition, employees engaged in housekeeping activities in facilities with asbestos product manufacturing operations and in public and commercial buildings with installed asbestos containing materials may be exposed to asbestos fibers. Most of these workers are covered by this general industry standard, with the exception of state or local governmental employees in non-state plan states.

(d) Employees who perform housekeeping activities during and after construction activities are covered by the asbestos construction standard, 29 CFR 1926.1101, formerly 1926.58. However, housekeeping employees, regardless of industry designation, should know whether building components they maintain may expose them to asbestos. The same hazard communication provisions will protect employees who perform housekeeping operations in all three asbestos standards; general industry, construction, and shipyard employment.

(e) As noted in the construction standard, building owners are often the only and/or best source of information concerning the presence of previously installed asbestos containing building materials. Therefore they, along with employers of potentially exposed employees, have specific information conveying and retention duties.

12. USE OF RESPIRATORS

(a) For employees who use respirators required by this section, NSE must provide respirators that comply with the requirements of this paragraph. Respirators must be used during:

- (1) Periods necessary to install or implement feasible engineering and work-practice controls
 - (2) Work operations, such as maintenance and repair activities, for which engineering and work-practice controls are not feasible
 - (3) Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposure to or below the TWA and/or excursion limit
 - (4) Emergencies
- (b) NSE has established and implemented a written Respiratory Protection Process in accordance with 29 CFR 1910.134. Any use of respirators regarding asbestos work shall be done in compliance with NSE's Respiratory Protection Process and OSHA requirements.
 - (c) NSE shall provide a tight-fitting, powered, air-purifying respirator instead of any negative-pressure respirator specified in Table 1 of 1910.1001(g)(3) when an employee chooses to use this type of respirator and the respirator provides adequate protection to the employee.
 - (d) No employee must be assigned to tasks requiring the use of respirators if, based on their most recent medical examination, the examining physician determines that the employee will be unable to function normally using a respirator, or that the safety or health of the employee or other employees will be impaired by the use of a respirator. Such employees must be assigned to another job or given the opportunity to transfer to a different position, the duties of which they can perform. If such a transfer position is available, the position must be with the same employer, in the same geographical area, and with the same seniority, status, and rate of pay the employee had just prior to such transfer.
 - (e) NSE shall select and provide the appropriate respirator from Table 1 of 1910.1001 (g)(3).
 - (f) Employees wearing negative pressure respirators shall have either quantitative or qualitative fit tests. The qualitative fit tests may be used only for testing the fit of a half mask. The project supervisor shall have the responsibility for ensuring that this testing is performed in accordance with NSE's written Respiratory Protection Process and OSHA requirements under 29 CFR 1910.134.

13. REQUIREMENTS FOR PROTECTIVE WORK CLOTHING & EQUIPMENT

If an employee is exposed to asbestos above the TWA and/or excursion limit, or where the possibility of eye irritation exists, NSE shall provide at no cost to the employee, and ensure that the employee uses, appropriate protective work clothing and equipment such as, but not limited to:

- (a) Coveralls or similar full-body work clothing
- (b) Gloves, head coverings, and foot coverings; and
- (c) Face shields, vented goggles, or other appropriate protective equipment which complies with 1910.132

14. SPECIFIC INFORMATION REGARDING PPE

NSE shall provide information about respirators and protective clothing, which will include selection, use, limitations, care etc.

15. MEDICAL SURVEILLANCE AND EXPOSURE MONITORING

All personnel working with asbestos in class I, II, or III work and are exposed at or above the PEL for more than 30 days a year must have medical surveillance through annual physicals and their exposure levels must be monitored and documented. All documentation must be kept for 30 years. A licensed physician must perform or supervise the exam.

16. ROUTE OF ENTRY

Inhalation (breathing in) is the route of entry for asbestos fibers. Studies have shown that inhalation of asbestos fibers leads to increased risks of developing several diseases.

17. ASSOCIATED DISEASES

Asbestosis, lung cancer, and mesothelioma are the primary diseases caused by asbestos exposure. Others include but are not limited to pleural plaques, pleural effusion, pleural thickening, cancer of the gastrointestinal tract and kidney cancer.

18. INTERACTION BETWEEN ASBESTOS AND SMOKING

The relationship between smoking and asbestos exposure is called a synergistic effect since exposure to both greatly increase the risk of disease. Workers who smoke cigarettes and are exposed to asbestos are 50 to 90 times more likely to get lung cancer than nonsmoking, non-exposed workers.

19. INSURANCE

It is a requirement that insurance coverage includes a rider for asbestos for any contractor working with asbestos.

20. EXPOSURE ASSESSMENT

(a) An exposure assessment is the decision making process that develops the execution of the job. The factors that are involved in making that decision are:

(1) Class of removal being performed:

(i) Class I - removal of thermal insulation systems for demolition or renovation

(ii) Class II - removal of non-friable asbestos such as floor tile or transite

(iii) Class III - O & M activities

(iv) Class IV - Janitorial activities

(2) Operation or shut down of equipment

(3) Temperature of equipment

(4) Public building or industrial facility

(5) Indoors or outdoors

(6) Prior exposure data

(b) A negative exposure assessment requires that all asbestos work must begin with type C respirators unless a negative exposure assessment can be produced. Negative exposure assessment can be produced in two ways:

(1) Objective data - the type of asbestos (non-friable such as transite) and the method of removal will not release fibers above the PEL

(2) Historical data - you have completed a sufficient number of similar jobs, using personnel with similar work experience, under similar conditions without releasing fibers in excess of the PEL with respect to the protection factors of the respirators being used

21. PROHIBITED WORK PRACTICES

The following work practices and engineering controls are prohibited for all asbestos related work or work that disturbs asbestos or presumed asbestos-containing materials, regardless of measured exposure levels of initial exposure assessment:

- (a) High-speed abrasive disc saws not equipped with point of contact ventilator or enclosure with HEPA filtered exhaust air
- (b) Compressed air to remove asbestos or asbestos-containing materials, unless the compressed air is used with an enclosed ventilation system by sweeping, shoveling, or dry cleanup of dust and debris
- (c) Employee rotation to reduce exposure

22. ENGINEERING CONTROLS

The purpose of any engineering control is to eliminate the hazard. In the case of asbestos abatement, the engineering controls should be designed to eliminate air-borne fibers.

- (a) Class I abatement requires as a minimum:
 - (1) HVAC systems must be isolated with 6 mil double layer plastic or equivalent
 - (2) Impermeable drop cloths
 - (3) All objects within the regulated area must be covered or removed
 - (4) Ventilate regulated area through HEPA filtration
 - (5) Negative pressure enclosures or negative pressure glovebags in conjunction with wet methods of removal or small walk-in enclosure
- (b) Class II abatement requires:
 - (1) Critical barriers
 - (2) Impermeable drop cloths
 - (3) Do not cut, abrade, or break material unless infeasible
 - (4) Thoroughly wet material with amended water before and during removal
 - (5) Remove the material intact, if possible

- (6) Immediately bag or wrap removed material
- (c) Class III abatement requires:
 - (1) Use wet methods and ventilation
 - (2) If drilling, cutting, abrading, sanding, chipping, breaking, or sawing must use impermeable drop cloths and enclosures or glove bag systems
- (d) Class IV abatement requirements:
 - (1) Wet methods and HEPA vacuums to clean up debris
 - (2) Must wear respirator if inside a regulated area
- (e) Glovebags and mini-enclosures for piping and small equipment:
 - (1) Negative pressure glove bags and mini-enclosures are an easy, economical way of abating small-bore piping and equipment
 - (2) A HEPA Vacuum is utilized to create negative pressure inside the glove bag or mini-enclosure to ensure no fibers are released into the atmosphere
 - (3) The main limitation for glove bags is on equipment that is in operation. If the surface temperature is too hot, it can melt the bags, or increase the temperature inside the bag to the point that it could burn the workers' hands. If the equipment is less than 150 degrees (temperature limitation set by OSHA) this should not be a problem.

23. ENCLOSURES

Enclosures for large scale projects and equipment:

- (a) A Negative Pressure Enclosure is utilized when there is a large amount of removal done in a small area or when the equipment is large enough that glove bags or mini-enclosures are not feasible. Negative pressure is achieved by negative air machines that pull as much as 1600 CFM. It is required to have a minimum of 4 air changes an hour inside the enclosure. The enclosure must be as air tight as possible to ensure negative pressure

- (b) **Regulated Area:** A regulated area is defined by OSHA to be all areas where airborne concentrations of asbestos may be present. An asbestos barricade with asbestos warning signs must be placed around the regulated area. This area must be maintained regardless of monitor results. Access to this area shall be strictly controlled and limited to authorized personnel only. Entrance and exit registers must be maintained to monitor and control the number of personnel in the regulated area. Only personnel with documented training, medical clearance and proper personal protective equipment are allowed entry into the regulated area. All personnel must be decontaminated upon exit from a regulated area, regardless of type and quantity of asbestos, method of removal or exposure levels
- (c) **Wet Method:** All classes of removal require the asbestos material to be sprayed with amended water, using an airless sprayer throughout the duration of the removal process. Amended water is simply water with a surfactant additive that breaks down the surface tension of the water to make it absorb more readily. The disposal bags must be sealed and of sufficient water use must be evident
- (d) **Lockdown:** Once all gross removal is complete and all surfaces inside the glove bag or enclosure are clean, lockdown or encapsulates is sprayed over the entire inside of the enclosure or glove bag

24. EXPOSURE MONITORING

Exposure monitoring comes in two forms -- Area and Personnel.

- (a) **Area Monitoring:** All monitoring must be done in an ethical fashion. The abatement contractor cannot do air monitoring. It is recommended monitoring be done by a third party. An accredited lab must read all samples. Area and personnel sampling are usually read by phase contrast microscopy. Final clearance samples must be read by transmission electron microscopy.

Area monitoring documents the exposure inside and /or outside of the containment, glove bag or mini-enclosure. This information can be used to forewarn you of possible difficulty with your engineering controls or removal methods for example. A higher than expected reading inside the enclosure could be caused by inadequately wetting the material before abating. A higher than expected reading outside the enclosure could be caused by a bad seal in the enclosure or a faulty negative air machine.

- (b) **Personnel Monitoring:** Personnel monitoring is important, because it tells you what level of exposure your personnel are exposed to in their breathing zone. This data is critical when making a negative exposure assessment. OSHA requires an exposure monitoring and final clearance. A minimum of 1/4 of your work force must be monitored each day.

25. FINAL CLEARANCE MONITORING

- (a) Before any critical barriers in an enclosure can be taken down, air samples must be taken and analyzed to show that there are no airborne fibers left inside the enclosure.
- (b) These samples must be read by transmission electron microscopy. In addition to the air samples a visual inspection by your environmental contractor must be performed.
- (c) Once the environmental contractor has signed off that final clearance has been achieved, the enclosure can then be dismantled.

APPENDIX 1

DEFINITIONS

1. Adequately Wet: This means per 40 CFR 61, Subpart M, NESHAPs, sufficiently mixed or coated with water or an aqueous solution to prevent dust emissions. Further, as per the EPA 340/1-90-015, Definitions, adequately wet means sufficiently mix or penetrate with a liquid to prevent release of particulates. If visible emissions are observed coming from asbestos-containing material then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being wet.
2. Aggressive Method: Removal or disturbance of building material by sanding, abrading, grinding or other method that breaks crumbles or disintegrates intact ACM.
3. Amended Water: This means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.
4. Asbestos: Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered. For purposes of this standard, "asbestos" includes PACM, as defined below.
5. Asbestos-Containing Material (ACM): Any material containing more than one percent asbestos.
6. Authorized Person: Any person authorized by NSE and required by work duties to be present in regulated areas.
7. Building/Facility Owner: Legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.
8. Category I Nonfriable ACM: Asbestos-containing packings, gaskets, resilient floor coverings and associated mastics, and asphalt roofing products containing more than one percent asbestos.
9. Category II Nonfriable ACM: Any material, excluding Category I nonfriable ACM containing more than one percent asbestos that, when dry, cannot be crumbled, cannot be crushed, pulverized, or reduced to powder by hand pressure.
10. Certified Industrial Hygienist (CIH): One certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.
11. Class I Asbestos Work: Activities involving the removal of TSI (Thermal System Insulation) and surfacing ACM and PACM.
12. Class II Asbestos Work: Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of

asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

13. Class III Asbestos Work: Repair and maintenance operations, where ACM, including thermal system insulation and surfacing material, is likely to be disturbed.
14. Class IV Asbestos Work: Maintenance and custodial activities during which employees contact ACM and PACM, and activities to clean up waste and debris containing ACM and PACM.
15. Clean Room: Means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.
16. Closely Resemble: Means that the major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.
17. Competent Person: Means, in addition to the definition in 29CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure; who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f): In addition, for Class I and Class II work who is specially trained in a training course which meet the criteria of EPA's Model Accreditation Plan (40 CFR 763) for project designer or supervisor, or its equivalent and, for Class II and Class IV work, who is trained in an operations and maintenance (O & M) course developed by EPA (40 CFR 763.92 (a)(2)).
18. Critical Barrier: One or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.
19. Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.
20. Demolition: The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.
21. Director: The Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.
22. Disturbance: Means contact which releases fibers from ACM or PACM or debris containing ACM or PACM. This term includes activities that disrupt the matrix of ACM or PACM, render ACM or PACM friable, or generate visible debris. Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount which can be contained in one standard-sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.

23. Employee Exposure: Means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
24. Equipment Room (change room): A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.
25. Fiber: A particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.
26. Friable ACM: When dry, can be crumbled, pulverized, or reduced to powder by normal hand pressure.
27. Glove Bag: Means an impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.
28. HEPA Filter: High-efficiency particulate air filter which is capable of trapping and retaining at least 99.97% of all mono dispersed particles of 0.3 micrometers in diameter or larger.
29. Homogeneous Area: An area of surfacing material or thermal system insulation that is uniform in color and texture.
30. Industrial Hygienist: A professional person qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.
31. Intact: Means that the ACM has not crumbled, been pulverized or otherwise deteriorated so that it is no longer likely to be bound with its matrix.
32. Modification for purposes of paragraph (g)(6)(ii): A changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system. Omitting a procedure or component, or reducing or diminishing the stringency or strength of a material or component of the control system is not a "modification" for purposes of paragraph (g)(6)(ii) of 29 CFR 1926.1101.
33. Negative Initial Exposure Assessment: Means a demonstration by NSE, which complies with the criteria in this section, that employee exposure during an operation is expected to be consistently below the PELs.
34. PACM: Means "presumed asbestos containing material".
35. Presumed Asbestos Containing Material: Means thermal system insulation and surfacing material found in buildings constructed no later than 1980. The designation of a material as "PACM" may be rebutted pursuant to paragraph (k)(4) of this section.
36. Project Designer: A person who has successfully completed the training requirements for an abatement project designer established by 40 U.S.C. §763.90(g).

37. Regulated Area: An area established by NSE to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit. Requirements for regulated areas are set out in paragraph (e)(6) of 29CFR 1926.1101.
38. Removal: All operations where ACM and/or PACM are taken out or stripped from structures or substrates, and include demolition operations.
39. Renovation: The modifying of any existing structure, or portion thereof.
40. Repair: Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.
41. Surface Material: Material that is sprayed, troweled or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces or acoustical fireproofing, and other purposes).
42. Surfacing ACM: Means surfacing material which contains more than 1% asbestos.
43. Thermal system insulation(TSI): Means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.
44. Thermal system insulation ACM: Is thermal system insulation which contains more than 1% asbestos.

NEXTSUN ENERGY, LLC
Bloodborne Pathogens Process

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NEXTSUN ENERGY, LLC

Bloodborne Pathogens Exposure Control Plan

1. PURPOSE

- (a) NextSun Energy, LLC is committed to providing a safe and healthful work environment. In pursuit of this endeavor, the following Exposure Control Plan (ECP) is provided to eliminate or minimize occupational exposures to bloodborne pathogens.
- (b) The basis of this plan is to comply with the OSHA Bloodborne Pathogens Standard. It will provide protection for employees through the use of "Universal Precautions" as a major component of the plan. Because individuals generally cannot know whether blood, body fluids or detached tissues are infected with bloodborne pathogens, Universal Precautions assumes that **ALL** blood and body fluids are infectious and must be treated accordingly.

2. SCOPE

- (a) This plan applies to all employees who have an occupational exposure to bloodborne pathogens and includes:
 - (1) NextSun Energy, LLC (NSE)
 - (2) All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NSE management
 - (3) All NSE, contractors, sub contractors, their workers and suppliers, while working under NSE contracts
- (b) The plan also ensures that these employees will be trained regarding preventing and responding to bloodborne pathogens exposures prior to assignment, with training, providing personal protective equipment and other elements of implementation at no cost to the employee. The ECP shall also be used as a basis for training.

3. REFERENCE

29 CFR 1910.1030

4. RESPONSIBILITIES

- (a) The NSE Safety Director (Director) shall be responsible for effective implementation

and management of this plan.

- (b) The Director will also be responsible for reviewing and updating the ECP annually or sooner if necessary, to reflect any new or modified tasks and procedures which affect occupational exposure.
- (c) All employees will have access to and the opportunity to review this plan at any time during their work shifts by contacting their supervisor or the NSE's Director. A copy of the plan is available at no charge and within 15 days of the request.

5. EMPLOYEE EXPOSURE DETERMINATION

- (a) Occupational exposure to blood and body fluids is limited to our designated first aid responders as they are needed for a jobsite where professional emergency medical services are not readily available within an acceptable response time.
- (b) When professional emergency medical services are readily available within an acceptable response time, NSE personnel are not required as part of their employment to provide first aid or CPR to another person.
- (c) Although this ECP includes considerations and provisions for the proper selection and use of personal protective equipment, such implementation shall be performed without consideration of whether personal protective equipment is utilized.
- (d) Our facility has decided to offer the hepatitis B pre-exposure vaccination to each first aid provider at the time they are so designated and prior to their commencement of these responsibilities.
- (e) In the event of a first aid incident, if blood or other potentially infectious materials are present, the affected first aid responder(s) is instructed to report to the Director before the end of his or her work shift.
- (f) The Director will maintain a report that includes the name of the first aid responder, as well as the date, time and description of the incident. The Director will ensure that any first aid responder that desires the vaccine series after an incident will receive it as soon as possible, but not later than twenty four hours after the incident.
- (g) The Director will train first aid providers on the specifics of the reporting procedures and all other training associated with bloodborne pathogen requirements.

6. ENGINEERING CONTROLS AND WORK PRACTICES

- (a) Engineering controls and work practice controls will be used to prevent or minimize exposure. Hand washing facilities are available at all jobsites. Employees will wash after administering first aid. In the event that hand washing facilities are not available, disposable "one use" towelettes that utilize disinfecting and sanitizing products shall be

provided and used by affected personnel until proper hand washing is possible. All equipment used or contaminated during first aid assistance will be decontaminated in a proper manner or discarded in appropriate containers.

- (b) Engineering controls and work practices shall be reviewed as needed, and at least annually, to ensure that procedures continue to be effective in preventing employee exposures. Additionally, in the event of a reported “near miss” incident involving potential exposure to bloodborne pathogens, engineering controls and work practices shall also be reviewed and revised as needed.

7. PERSONAL PROTECTIVE EQUIPMENT

- (a) First aid responders will use Personal Protective Equipment (PPE) appropriate for administering the first aid required. All jobsite first aid kits contain gloves, eye protection, resuscitation bags and one-way CPR mouthpiece devices.
- (b) PPE is provided by NSE at no charge or cost to employees. PPE may include items such as latex medical-type gloves, splash goggles, face shields and body protection such as aprons, depending on the anticipated situations for providing first response in a medical emergency. PPE shall be provided in various types and sizes to facilitate ease of use. Additionally, PPE shall be replaced, decontaminated or repaired as necessary.
- (c) Life threatening situations may require immediate action before PPE can be obtained, for example, beginning CPR without a one-way CPR mask, or applying direct pressure to a hemorrhaging wound or amputation. In this situation, it is always the employee’s choice and at their discretion to render assistance without use of PPE until proper PPE can be obtained.
- (d) In such situations and when an employee chooses to render aid without proper PPE, they should take advantage of whatever barrier protection that may be immediately available. For example, regular safety glasses with side shields and standard work gloves usually will provide some level of additional barrier protection in comparison to not utilizing safety glasses and regular work gloves.

8. LABELING

Biohazard warning labels displaying the biohazard symbol will be placed on all containers for wastes, which may be contaminated with blood or body fluids, and red bags will be used as required.



BIOHAZARD SYMBOL

9. HOUSEKEEPING

- (a) If a first aid incident occurs, the first aid responders will take precautions to decontaminate work surfaces, tools and equipment. PPE will be used during cleanup.
- (b) Mechanical means such as tongs, forceps or a brush and a dust pan will be used to pick up contaminated broken glassware. The waste will be treated as regulated waste and disposed of in closable and labeled or color coded containers.
- (c) When storing, handling, transporting or shipping, place other regulated waste in containers that are constructed to prevent leakage. The waste will be discarded according to federal, state, and local regulations.
- (d) In the event of a first aid incident in which the first aid responders' clothes become contaminated, the following actions will be taken:
 - (1) Contaminated laundry will be handled as little as possible and with a minimum of agitation. Appropriate PPE will be worn when handling contaminated laundry.
 - (2) Contaminated laundry will be placed in color-coded bags at its location of use, and taken by a commercial launderer. The launderer will be given the appropriate warnings.

10. TRAINING

All designated first aid responders will receive training conducted by the Director or a qualified instructor designated by the Director. The bloodborne pathogens training plan will cover, at a minimum, the following elements:

- (a) A copy and explanation of the standard
- (b) Epidemiology and symptoms of bloodborne pathogens
- (c) Modes of transmission
- (d) The ECP and a way to obtain a copy

- (e) Methods to recognize exposures related to specific tasks, situations and other activities that may involve exposure to blood
- (f) Use and limitations of engineering controls, safe work practices, and PPE
- (g) PPE types, use, location, removal, handling, decontamination, disposal and basis for selection
- (h) Hepatitis B Vaccine offered free of charge. Training will be given prior to vaccination on its safety, effectiveness, benefits, and method of administration.
- (i) Emergency procedures for blood and other potentially infectious materials. Exposure incident procedures post exposure evaluation and follow up signs and labels

For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard which were not included need be provided.

Annual training for all employees shall be provided within one year of their previous training.

The Company shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

11. HEPATITIS-B VIRUS (HBV) VACCINATIONS

- (a) Employees who are required to provide first aid or emergency response duties or medical care on a routine basis will be offered Hepatitis-B Virus (HBV) vaccinations at NSE expense and with no charge or cost to the employee. Employees who transfer to a job, or if their job is reclassified to include exposure to bloodborne pathogens will be offered HBV vaccinations within 10 working days of the transfer or reclassification.
- (b) The choice for HBV vaccination is not mandatory. If affected employees choose not to have the vaccination at the initial offering, they will have the opportunity to be vaccinated when they are ready. NSE will document the offer, acceptance or declination, and vaccination dates using written formats as required by OSHA.

12. POST EXPOSURE EVALUATION AND FOLLOW UP

- (a) If an exposure incident occurs, contact the Director immediately. A confidential medical evaluation and follow up will be conducted by the NSE's designated medical provider. The following will be performed:
 - (1) Document the routes of exposure and how exposure occurred

- (2) Identify and document source individual, unless infeasible or prohibited by state or local law
 - (3) Obtain consent and test source individual's blood, document the source's blood test results. If the source individual is known to be infected, testing need not be repeated
 - (4) Provide the exposed employee with the source individual's test results, and if information about applicable disclosure laws and regulations concerning the source identity and infectious status
 - (5) After obtaining consent, collect exposed employee's blood as soon as feasible after the exposure incident and test blood for HBV and HIV serological status
 - (6) If the employee does not give consent for HIV serological testing during the collection of blood for baseline testing, preserve the baseline blood sample for at least 90 days
- (b) The circumstances of exposure incidents will be reviewed to determine if procedures, protocols and/or training need to be revised.

13. HEALTH CARE PROFESSIONALS

Health care professionals responsible for employee's HB vaccination, post exposure evaluation and follow up will be given a copy of the OSHA Bloodborne Standard. The health care professional evaluating an employee after an exposure incident will also receive the following:

- (a) A description of the employee's job duties relevant to the exposure incident
- (b) Route(s) of exposure
- (c) Circumstances of exposure
- (d) If possible, a result of the source individual's blood test
- (e) Relevant employee medical records, including vaccination status

14. HEALTH CARE PROFESSIONAL'S WRITTEN OPINION

- (a) The designated Health Care Professional will provide the employee with a copy of the evaluating health care professional's written opinion within 15 days after completion of the evaluation. The written opinion for post exposure evaluation and follow up will be limited to whether or not the employee has been informed of the results of the medical evaluation and any medical conditions which may require further evaluation and treatment for HB vaccinations.

- (b) The opinion will be limited to whether the employee required or received the vaccine. All other diagnoses must remain confidential and not be included in the written report.

15. RECORDKEEPING

(a) Medical Records

- (1) Medical records are maintained for each employee with exposure in accordance with 29FCR-1910.1020. In addition to the requirements of 29 CFR 1910.1020, the medical record will include:
 - (i) The name, social security number, job designation of employee
 - (ii) Date(s) of bloodborne pathogens training, written acknowledgement of training and a record of the training curriculum utilized and the job assignment(s) or classifications of the personnel so trained
 - (iii) A copy of the employee's Hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination
 - (iv) A copy of all results of examinations, medical testing, and follow up procedures as required
 - (v) A copy of all health care professional written opinion(s) as required by the standard
- (2) Employee medical records will be kept confidential and will not be disclosed or reported without the employee's express written consent except as required by the standard or by law. Employee medical records shall be maintained for at least the duration of employment and, in the case of records regarding bloodborne pathogens plan compliance, at least an additional three years.
- (3) Employee medical records shall be provided (within 15 working days) upon written request of the employee or to anyone having written consent of the employee.
- (4) NSE shall maintain the records required for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.20.

(b) Training Records

Bloodborne pathogen training records will be maintained by the Director at a designated location.

Training records shall be maintained for 3 years from the date on which the training occurred.

(c) Transfer of Records

If NSE ceases to do business and there is not a successive employer, the employer shall notify the Director of the National Institute for Occupational Safety and Health (NIOSH) at least three months prior to the scheduled records disposal, and prepare to transmit them to the Director.

16. CREDENTIAL INFORMATION

- | | |
|---|---|
| (a) Designated First Aid Providers:
location | Foreman or Site Supervisor for work |
| (b) Medical Evaluations Performed By: | Local Physician as selected for the project
location |
| (c) Designated Health Care Professional: | Same as above |
| (d) Location of Training Records: | NextSun Energy, LLC
PO Box 974
Edwards, CO 81632 |

CHEMICALS

1. PURPOSE

This policy is intended as a guide for the safe use of chemicals.

2. SCOPE

This policy applies to projects where chemicals are used by:

- A. NextSun Energy, LLC (NSE)
- B. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management
- C. All NextSun Energy, LLC, contractors, sub contractors, and their workers, while working under NextSun Energy, LLC contracts

3. PROPER HANDLING

A. Be aware of hazards - when using solvents, chemical cleaners, water treatment chemicals, and other chemicals. Follow rules for their use. Treat all chemicals as potential hazards from delivery to use.

B. Hazard Communication Process – NextSun Energy Electric’s Hazard Communication process provides information on hazardous chemicals to affected employees by a MSDS (material safety data sheet). Each employee’s work headquarters has a copy of the process.

C. First Aid – Know the locations of eyewash, safety showers, and other first aid materials before working in an area.

D. Protective Equipment – Wear:

- i. Personal protective Equipment when handling acids, caustics, or other harmful chemicals
- ii. A full body suit with complete face protection when handling bulk tanker acids and caustics

E. Storage, Labeling and Transferring

- i. Store and clearly label chemicals and solvents in containers.
- ii. Label portable containers such as safety cans and plastic spray bottles.
- iii. Do not store or transfer these products in unmarked or improperly labeled containers.
- iv. Do not store acids with bases or oxidizers with reducers to prevent possible violent reactions between them.

EXCEPTION: Small quantities stored in laboratories.

F. Siphoning – Do not transfer solvents, chemicals or fuels using siphons unless there are both:

- i. A mechanical way to start the siphon flow (Never suck on the siphon with your mouth)
- ii. A way to control the shut-off of the siphon flow

G. **Spills** – Clean them up immediately.

4. **HERBICIDES**

- A. Forestry Division has a list of approved herbicides.
- B. Applicator must be certified for use greater than incidental.
- C. Follow all safety rules below and those general rules for chemicals covered earlier.
- D. Before using an herbicide, read its label carefully and follow the directions and precautions.
- E. Protect eyes and skin from contact.
- F. Do not transport or store herbicides in vehicle passenger compartments.
- G. After handling herbicides, wash your hands and face before eating, etc.
- H. Containers, Filling – Put only herbicides in their containers. Do not use the containers to transport other materials.

5. **SPRAYING**

- A. Release pressure on equipment before transit, making repairs, or storage.
- B. Do not breathe spray mist and avoid skin contact with spray material.
- C. Use seat belts or guard rails when spraying from a moving vehicle.

Containers, Disposing of – Follow proper procedures:

Type	To Dispose Of
Metal	Triple rinse and puncture top and bottom
Paper	Empty completely and leave open at top and bottom
Plastic	Triple rinse and puncture at top and bottom. Do not burn them, it can cause toxic smoke

6. **SOLVENTS** - Are hazardous – They present a fire or health hazard unless used properly.

- A. Use only approved solvents having a MSDS in database.
- B. Use protective equipment like gloves, aprons, chemical splash goggles, airtight clothing, etc. when working with solvents.
- C. Do not use a solvent without adequate ventilation.
- D. Have fire-extinguishing equipment easily available when using flammable solvents.

7. **SAFETY CANS**

- A. Use approved safety cans to store and handle flammable liquids.
- B. Labeling Safety Cans

- i. With yellow lettering, conspicuously label safety cans containing flammable Liquids.
 - ii. Be sure cans have the NextSun Energy Hazard Communication Container Label filled out.
- C. When pouring or pumping gasoline or other flammable liquids from one container to another, keep metallic contact between the containers.
- D. Combustible Liquid with Flash Point Over 100°F – This does not have to be in a safety can. Be sure the container is of good quality, has no leaks of liquid or vapor and is adequately labeled, including the name of contents.

8. **PAINTING**

A. Safety Requirements – Before painting, get these requirements from the MSDS.

B. Open Flames/Clothing – If your clothes are contaminated with paint or thinner, avoid an open flame.

C. When spray painting:

- i. Be sure the area is well ventilated by exhaust systems and is protected against all ignition sources
- ii. Do not stand between object being painted and exhaust intake
- iii. Use a respirator equipped with organic paint cartridges when spraying solvent based paint with air or airless sprayers

Note: Employee – Be medically qualified and fit tested to wear a respirator. Contact Lenses – Can be worn with full face respirator.

- iv. Minimal use of aerosol can in a well ventilated area without a respirator is allowed
- v. Do not smoke, weld, burn, or use an open flame

9. **ASBESTOS HANDLING**

A. If you suspect asbestos, contact the person in charge or the supervisor.

B. Handle asbestos containing materials in a manner to ensure employees are not exposed to excessive levels of airborne asbestos dust.

C. Removal – Perform in accordance with NextSun Energy Asbestos process.

COMPRESSED GASES

1. PURPOSE

This policy is intended as a guide for the safe use and care of compressed gases.

2. SCOPE

This policy applies to projects where compressed gases are required to be utilized by:

- A. NextSun Energy, LLC (NSE)
- B. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management
- C. All NextSun Energy, LLC, contractors, sub contractors, and their workers, while working under NextSun Energy, LLC contracts

3. CYLINDERS GENERAL

A. Carefully handle compressed gas cylinders

B. Storing and Transporting

In the room or entrance where compressed flammable gas is stored, conspicuously post a sign indicating:

- i. Danger, NO Smoking, Matches, or Open Lights
- ii. Name of gas being stored

C. Do Not Store:

- i. Flammable gas near oxygen or other oxidizing material
- ii. Oxygen near combustible materials (especially oil or grease). Locate at least 20 feet away or provide 5 foot high non-combustible barrier
- iii. Compressed gases near flammable chemicals

D. Put the valve cap or other valve protection device on the cylinder.

E. When storing, secure full or empty cylinders upright and with chain so they cannot fall.

F. Do not roll cylinders on their sides.

G. Do not transport cylinders in the passenger compartment of a vehicle.

H. When transporting, properly secure all cylinders.

I. Leaks

- i. Never use a flame to find a leak.

- ii. Do not use a leaking cylinder.

J. Connections and valves

- i. Never force a connection that does not fit.
- ii. Do not tamper with cylinder valve safety relief devices.
- iii. Before removing from a cylinder, close the tank valve and release all pressure.
- iv. Slowly open a compressed gas cylinder shut-off valve to prevent frosting or freezing.

K. Other Procedures

- i. Properly identify cylinder contents.
- ii. Do not put a cylinder where it could become part of an electrical circuit.
- iii. Do not mix gases in a cylinder.
- iv. Do not put tools in the recessed top of a cylinder.
- v. Do not let oil, grease, or similar lubricant contact any valve, fitting, regulator, or gauge of an oxygen cylinder.

NEXTSUN ENERGY, LLC
Confined Space Entry Process

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NEXTSUN ENERGY, LLC

Confined Space Entry Process

2. PURPOSE

This process contains requirements for practices and procedures for NextSun Energy, LLC to protect employees in the general and construction industries from the hazards of entry into permit-required confined spaces.

3. SCOPE

The Confined Space Process applies to:

- (a) NextSun Energy, LLC (NSE)
- (b) All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NSE management
- (c) All NSE contractors, sub contractors, their workers and suppliers, while working under NSE contracts

4. REFERENCE

- (a) 29 CFR 1910.146
- (b) 29 CFR 1926.21(b) (6)

4. GENERAL

- (a) The Site Supervisor shall evaluate the workplace to determine if any spaces are permit-required confined spaces. The client may provide a list when working at remote locations.
- (b) If the workplace contains permit spaces, the Project Supervisor in conjunction with the Site Safety Supervisor/Representative and the client, shall inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the permit spaces.

NOTE: A sign reading *DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER* or using other similar language would satisfy the requirement for a sign.

- (c) If the Site Supervisor decides that NSE employees will not enter permit spaces, effective measures shall be taken to prevent employees from entering the permit spaces.

- (d) If the Site Supervisor decides that NSE employees will enter permit spaces, a site specific written permit space process shall be developed and implemented in accordance and compliance with NSE's and client's confined space entry procedures. The written process shall be available for inspection by employees.
- (e) When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.
- (f) If the Site Supervisor has reason to believe that the measures taken under the permit space process may not protect employees, the supervisor shall revise the process to correct deficiencies found to exist before subsequent entries are authorized. The NSE Safety Director (Director) shall be informed about any such action and assist the Site Supervisor as needed in the revisions. Examples of circumstances requiring the review of the permit space process include:
 - (1) Any unauthorized entry of a permit space
 - (2) The detection of a permit space hazard not covered by the permit
 - (3) The detection of a condition prohibited by the permit
 - (4) The occurrence of an injury or near-miss during entry
 - (5) A change in the use or configuration of a permit space, and / or
 - (6) Employee complaints about the effectiveness of the process

5. SITE SPECIFIC WRITTEN PROCESS

- (a) Before entry into any confined space at any NSE controlled jobsite, a site specific written process must be developed.
- (b) The Site Supervisor shall develop the site specific written process. The written process shall be approved by the NSE Director.
- (c) The site specific written process shall comply with OSHA 29 CFR 1910.146 and contain the following elements:
 - (1) Measures necessary to prevent unauthorized entry
 - (2) Methods used to identify and evaluate the hazards of permit spaces before employees enter them
 - (3) Specify acceptable entry conditions

- (4) Methods used in isolating the permit space
- (5) Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards
- (6) Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards
- (7) Methods used to verify that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry
- (8) Identify testing and monitoring equipment needed to comply with NSE's written confined space entry safety process
- (9) Identification of authorized entrants, attendants and entry supervisors
- (10) Ventilating equipment needed to obtain acceptable entry conditions
- (11) Communications equipment necessary
- (12) Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees
- (13) Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency
- (14) Equipment, such as ladders, needed for safe ingress and egress by authorized entrants
- (15) Rescue and emergency services provided
- (16) Training provided to entry supervisors, authorized entrants and attendants

6. **ENTRY PROCEDURE GUIDELINES**

The following guidelines are provided to assist the Site Supervisor in preparing the site specific written process.

- (a) Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.
- (b) Lockout /Tag out procedures must be followed during a permit-required confined space entry.
- (c) All entrants must wear a safety harness with retrieval rope attached to the d-ring on the back of the harness.

Note: More often, it is the responsibility of the client to prepare a confined space for entry. Procedures must be developed to ensure that information concerning the preparation of confined spaces by the client is communicated to NSE personnel.

- (d) When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.
- (e) Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:
 - (1) Oxygen content
 - (2) Flammable gases and vapors, and
 - (3) Potential toxic air contaminants
- (f) The entry supervisor who performs monitoring of the confined space shall involve entrants in the monitoring process and/or notify entrants of the potential hazards and monitoring results. Entrants shall be involved and participate in the process of reviewing the written permit and signing of the permit.
- (g) Employees or their representatives are entitled to request additional monitoring at any time during the confined space entry operation.
- (h) Individuals shall not enter a confined space that is immediately hazardous to life or health. Initial testing to determine potential hazards that require entry shall have an approved and documented Standard Operating Procedure with a two-level approval, one of which must be the Site Superintendent and the NSE Director.
- (i) There shall be no hazardous atmosphere within the space whenever any employee is inside the space.
- (j) An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere. The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space. The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- (k) The atmosphere within the space shall be continually tested to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere and providing sufficient oxygen to the worker.

- (l) If a hazardous atmosphere is detected during entry, each employee shall leave the space immediately. The space shall be evaluated to determine how the hazardous atmosphere developed and measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.
- (m) The entry supervisor shall verify that the space is safe for entry and that the pre-entry measures required by this NSE process have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification shall be made before entry and shall be made available to each employee entering the space. This can be accomplished by means of an entry permit provided by the client.
- (n) The Site Supervisor shall designate the persons who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and provide each such employee with the training required by this NSE process.
- (o) NSE shall provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations.
- (p) If multiple spaces are to be monitored by a single attendant, include in the permit process the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities under this process.
- (q) The Site Superintendent in conjunction with The NSE Director and the client shall develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue. Emergency equipment must be inspected prior to any entrance into the confined space.
- (r) If an entrant is in need of rescue, the attendant's sole responsibility is to sound the alarm to evacuate any other entrants and summon emergency personnel. Under no circumstance shall an attendant enter the confined space by himself.
- (s) Before entry begins, the entry supervisor identified on the permit shall sign the entry permit to authorize entry.
- (t) The completed permit shall be made available at the time of entry to all authorized entrants, by posting it at the entry portal or by any other equally effective means; so that the entrants can confirm that pre-entry preparations have been completed.
- (u) All entrants must be signed in and out by the attendant every time they enter or exit the confined space.
- (v) The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit.

- (w) The entry supervisor shall terminate entry and cancel the entry permit when:
- (1) The entry operations covered by the entry permit have been completed; or
 - (2) A condition that is not allowed under the entry permit arises in or near the permit space
 - (3) The work area emergency system is activated
- (x) When NSE arranges to have employees of another employer (contractor) perform work that involves permit space entry, NSE shall:
- (1) Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space process meeting the requirements of this NSE process
 - (2) Apprise the contractor of the elements, including the hazards identified and NSE's experience with the space, that makes the space in question a permit space
 - (3) Apprise the contractor of any precautions or procedures that NSE has implemented for the protection of employees in or near permit spaces where contractor personnel will be working
 - (4) Coordinate entry operations with the contractor, when both NSE personnel and contractor personnel will be working in or near permit spaces
 - (5) Debrief the contractor at the conclusion of the entry operations regarding the permit space process followed and regarding any hazards confronted or created in permit spaces during entry operations

7. TRAINING

- (a) NSE shall provide training so that all employees whose work is regulated by NSE and OSHA safety requirements for entering and working in confined spaces shall acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
- (b) The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this process.
- (c) NSE shall certify that the training required by this process has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

- (d) The NSE Director shall ensure that training is provided so that all employees whose work is regulated by this NSE process acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
- (e) Training shall be provided to each affected employee:
 - (1) Before the employee is first assigned duties under this NSE process
 - (2) Before there is a change in assigned duties
 - (3) Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained
 - (4) Whenever the Site Supervisor has reason to believe either that there are deviations from the permit space entry procedures required by this NSE process or that there are inadequacies in the employee's knowledge or use of these procedures
- (f) The training shall establish employee proficiency in the duties required by this NSE process and shall introduce new or revised procedures, as necessary, for compliance with this section.
- (g) The Site Supervisor shall certify that the training required by this NSE process has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees.
- (h) The training shall include the following
 - (1) Duties of authorized entrants:
 - (i) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
 - (ii) Proper use of equipment as required by the permit
 - (iii) Communication method used with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space
 - (iv) Alert the attendant whenever the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or the entrant detects a prohibited condition
 - (v) Exit from the permit space as quickly as possible whenever an order to evacuate is given by the attendant or the entry supervisor, the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, the entrant detects a prohibited condition, or an evacuation alarm is activated

(2) Duties of attendants:

- (i) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
- (ii) Is aware of possible behavioral effects of hazard exposure in authorized entrants
- (iii) Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants who are in the permit space is accurate
- (iv) Remains outside the permit space during entry operations until relieved by another attendant
- (v) Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space
- (vi) Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - $\frac{3}{4}$ If the attendant detects a prohibited condition
 - $\frac{3}{4}$ If the attendant detects the behavioral effects of hazard exposure in an authorized entrant
 - $\frac{3}{4}$ If the attendant detects a situation outside the space that could endanger the authorized entrants; or
 - $\frac{3}{4}$ If the attendant cannot effectively and safely perform all the duties required under this NSE process
- (vii) Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards
- (viii) Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - $\frac{3}{4}$ Warn the unauthorized persons that they must stay away from the permit space
 - $\frac{3}{4}$ Advise the unauthorized persons that they must exit immediately if they have entered the permit space
 - $\frac{3}{4}$ Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space

- ¾ Performs non-entry rescues as specified by the site specific written process rescue procedure; and
- ¾ Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants

(3) Duties of entry supervisors:

- (i) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
- (ii) Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin
- (iii) Terminates the entry and cancels the permit as required
- (iv) Verifies that rescue services are available and that the means for summoning them are operable
- (v) Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and
- (vi) Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained

8. **EMEGENCY RESPONSE & RESCUE**

- (a) The Site Supervisor shall confirm in advance the availability of rescue and emergency services for Immediate Danger to Life and Health (IDLH) situations and have phone numbers available at the work location.
- (b) The Site Supervisor shall also ensure that there is a reliable method of communication available at the work location (land-line telephone, cellular telephone, two-way radio) for summoning rescue and emergency services should they be needed.
- (c) If rescue and emergency personnel are not able to respond to a call for assistance in a timely manner, the Site Supervisor shall obtain competent confined space rescue personnel to standby at the work location while confined space operations are in progress.

- (d) Rescue personnel shall be trained, properly equipped and authorized by the Site Supervisor to perform this service. Unauthorized personnel shall be prohibited from attempting a rescue.
- (e) When third-party rescue services are utilized for standby at the work location, service personnel shall be allowed to survey the confined space work location, select and obtain specialized equipment as required, and decline the standby assignment if that is their choice.
- (f) When rescue and emergency services are being provided by the host employer, this must be stipulated and specified in the written contract that the host employer has accepted and signed.
- (g) All personal protective equipment required when authorized and qualified employees perform rescue and emergency services shall be provided by NSE at no cost to the individual employees assigned to this duty.
- (h) When authorized and qualified NSE employees provide rescue and emergency services at confined space entry work locations, these individuals shall be provided with training and hands-on practice rescues at least annually.

9. **WRITTEN PROCESS REVIEW**

The NSE Director shall review the permit space process, using the canceled permits retained within one year after each entry and revise the process as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

APPENDIX 1

DEFINITIONS

1. "Attendant" means an individual stationed outside a permit-required confined space who monitors the authorized entrants and who performs all attendants' duties assigned in the employer's permit-required confined space process.
2. "Authorized entrant" means an employee who is authorized by NSE to enter a permit space.
3. "Confined space" means a space that:
 - a. Is large enough and so configured that an employee can bodily enter and perform assigned work; and
 - b. Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
 - c. Is not designed for continuous employee occupancy
 - d. Or has inadequate ventilation
4. "Entry" means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
5. "Entry supervisor" means the person (such as the foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this NSE.
6. "Isolation" means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

NEXTSUN ENERGY, LLC

Discipline in Support of Safety

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NEXTSUN ENERGY, LLC

Discipline in Support of Safety

1. PURPOSE

- (a) The disciplinary system for NextSun Energy, LLC (NSE) does not exist primarily to punish employees. Its purpose is to help control the work environment so that employees are protected and incidents are prevented. The disciplinary system helps ensure jobsite safety and health by letting NSE's employees know what is expected of them. It provides employees with opportunities to correct their behavior before an incident happens.
- (b) The disciplinary system is one of the keys to successfully implementing NSE's safety and health process. It ensures that NSE's rules and safe working practices are taken seriously by employees and are actually followed. It lets employees know how NSE expects them to operate in relation to the goals of NSE's safety and health process. And it lays out the actions NSE will take if individuals do not meet NSE's expectations. The employees' supervisor and all members of management are responsible for the enforcement of this disciplinary system.
- (c) A disciplinary system cannot work in a vacuum. Before NSE can hold employees accountable for their actions, NSE first has established its safety and health policy and disciplinary rules.

5. SCOPE

The Disciplinary System applies to:

- (a) NextSun Energy, LLC
- (b) All new, transferred or rehired employees as well as temporary help under the direct day to day supervision NSE management.
- (c) All NSE contractors, sub contractors, their workers and suppliers, while working under NSE contracts.

3. POLICY STATEMENT FOR ENFORCEMENT OF SAFETY

- (a) Employees need to know NSE's position on safety and health and what NSE expects of them. They need a clear understanding of the rules and the consequences of breaking those rules. This is true in all areas of work, but it is especially important for employee safety and health.

- (b) As part of the policy statement, and in the employee safety handbook, NSE has a written statement setting forth NSE's disciplinary policy.
- (c) NSE Safety Director, managers and supervisors will always be on the lookout for safety violations and will conscientiously and vigorously enforce NSE's commitment to safety. On a NSE jobsite, the Site Supervisor has specific responsibility for enforcing NSE safety rules, policies and safe work procedures.

4. EMPLOYEE INFORMATION AND TRAINING

- (a) It is important that employees understand the system and have a reference to turn to if they have any questions. Therefore, in addition to issuing a written statement of NSE's disciplinary policy, NSE has drawn up a list of what it considers major violations of NSE policy and less serious violations. This list specifies the disciplinary actions that will be taken for first, second, or repeated offenses. NSE will use the 5 Step Disciplinary System listed in Appendix 2 to correct minor "General Offenses."
- (b) Disciplinary violations that are grounds for immediate suspension and penalties up to and including termination of employment specifically include:
 - (1) Fighting, provoking or engaging in an act of violence against another person on NSE or customer property
 - (2) Failure to follow written or verbal safe work procedures, NSE or customer safety rules or authorized posted safety instructions
 - (3) Willful damage to property
 - (4) Failure to wear personal protective equipment (eye protection, hearing protection, hard hats, etc.)
 - (5) Not using safety harnesses and lanyards when fall protection is required
 - (6) Removing and/or making inoperative safety guards on tools and equipment
 - (7) Tampering with machine safeguards or removing machine tags or locks
 - (8) Removing barriers and/or guardrails and not replacing them
 - (9) Failure to follow recognized industry practices
 - (10) Failure to follow rules regarding the use of NSE equipment or materials
 - (11) Major traffic violations while using a NSE vehicle
 - (12) Engaging in dangerous horseplay

- (13) Failure to notify NSE of a hazardous situation
 - (14) Theft
 - (15) Violation of NSE policies regarding alcohol, non-prescription and illegal drugs, and
 - (16) Other major violations of NSE rules or policies
- (c) NSE supervisors, managers and personnel who have specific responsibilities for implementation and management of safety are expected to know, understand, support, implement and enforce NSE's policies, procedures, posted instructions and work practices relating to safety. In the event that NSE determines through direct observations, inspections, reviews of documentation and training or by other objective means that a supervisor, manager or authorized person has not performed his or her safety responsibilities, this shall be considered a disciplinary violation, punishable in the same way that misbehaviors explained in paragraph 4b are punishable.
- (d) Training can reduce the need for disciplinary action. NSE shall instruct employees in the importance of workplace safety and health, the need to develop safe habits, NSE's operations, safe work practices, and the hazards they control, and the standards of behavior that NSE expects.
- (e) NSE's employees must understand the disciplinary system and the consequences of any deliberate, unacceptable behavior.

5. SUPERVISION

- (a) Supervision includes both training and corrective action.
- (b) Ongoing monitoring of NSE's employees' work and safe habits gives NSE's supervisors the opportunity to correct any problems before serious situations develop. In most cases, effective supervision means correcting a problem before issuing any punishment.
- (c) Where the relationship between employees and their supervisors is open and interactive, problems are discussed and solutions are mutually agreed upon. This type of relationship fosters a work environment where the need for disciplinary action is reduced. When such action is needed, the parties are more likely to perceive it as corrective action rather than punitive.

6. EMPLOYEE INVOLVEMENT

- (a) Employees are encouraged to help informally in the enforcement of rules and practices. The intent here is not to turn employees into spies and informers, but to encourage them

to be their "brother's keeper" and to watch out for the safety and health of their colleagues.

- (b) Many employers successfully have encouraged an atmosphere, a company "culture", where employees readily speak up when they see an easily corrected problem, for example, a coworker who needs reminding to put on safety goggles.
- (c) Unless the safety violation is so serious that it requires immediate suspension and review for termination, NSE's employees deserve the opportunity to correct their own behavior problems.
- (d) An effective disciplinary system is a 2-way process. Once a problem is spotted, discuss it with the employee, who should be given at least 1 or 2 opportunities to change the behavior or correct the problem.
- (e) Only after these discussions (and possibly some retraining) should disciplinary action be taken.

7. APPROPRIATE CONTROL MEASURES

- (a) Disciplinary actions need to be proportionate to the seriousness of the offense and the frequency of its occurrence. It is certainly inappropriate to fire someone for occasional tardiness. It is equally inappropriate to issue only oral warnings to an employee who repeatedly removes a machine guard. Appendix 2 provides an example of disciplinary actions in a five-step disciplinary system.
- (b) Disciplinary procedures should not be instituted without explanation. NSE will provide feedback to the employee on what behavior is unacceptable, why the corrective action is necessary, and how the employee can prevent future violations and disciplinary action.
- (c) In addition, supervisors should take time to recognize an employee who improves or corrects his/her behavior.

8. CONSISTENT ENFORCEMENT

- (a) Workers must realize that safe work practices are a requirement of employment and that unsafe practices will not be tolerated. It is necessary, therefore, that the employer has a disciplinary system that is implemented fairly and consistently.
- (b) If NSE's disciplinary system is to work well and be accepted by NSE's workforce, the system applies equally to everyone. This includes subjecting managers and supervisors to similar rules and similar or even more stringent disciplinary procedures.
- (c) For minor violations, supervisors shall meet with the employee to discuss the infraction and inform the employee of the rule or procedure that was violated **AND** describe the corrective action needed to remedy the situation.

9. DOCUMENTATION

- (a) One key to ensuring fairness and consistency in a disciplinary system is keeping good records. It is in the best interest of both NSE and the employee to have written rules and disciplinary procedures.
- (b) It is just as important to document instances of good or poor safety and health behavior, including discussions with the employee, and to place relevant information in the employee's personnel file.
- (c) The Safety Hazard Citation format below shall be used to document infractions.
- (d) Documentation serves a variety of purposes. It helps NSE to track the development of a problem, corrective actions, and the impact of measures taken. It provides information so NSE can keep employees informed of problems that need correction.
- (e) When NSE is evaluating the managerial and supervisory skills of a supervisor, it provides a useful record of how they handled problems.
- (f) If warnings, retraining, and other corrective actions fail to achieve the desired effect, and if NSE decides to discharge an employee, then documentation becomes even more critical. Conversely, NSE will conduct an annual clearing of the personnel files of employees whose good overall safety records are marred by minor warnings.
- (g) Minor safety violations will be documented in a manner comparable to the example below, and a copy of the form will become part of the employee's personnel record. Three citations can be grounds for termination.

Safety Hazard Citation	Date:
Name of Violator	
Location of Violation	
Type of Violation	
Signature of Employee Cited	
A copy of this Citation will be placed in the employee's Employment File. Three Citations can be grounds for termination.	

10. POSITIVE REINFORCEMENT

- (a) Each supervisor should provide frequent reinforcement of work practices training.
- (b) Informal observation serves not only to gauge training effectiveness, but also to reinforce the desired behavior.

- (c) Supervisors should also provide special recognition for the use of safe work practices. For examples, supervisors may hand out "Thank you for working safely" cards that can be redeemed for a free cup of coffee or soft drink when they observe a positive safety behavior.
- (d) When a supervisor periodically observes individual workers at their tasks, he or she should give oral and/or written feedback on what was done safely.
- (e) OSHA recommends award systems that recognize positive activities rather than absence of injuries. Supervisors and safety managers should be aware that award programs with prizes for hours worked without injury may have the unintended consequence of putting heavy peer pressure on workers **NOT** to report injuries.

APPENDIX 1

Tracking of Individual
Safety Disciplinary Actions

Employee _____

TRACKING	First Offense Date & Response	Second Offense Date & Response	Repeated Violations Date & Response
Unsafe Work Habits			
Refusal to Follow Safety Instructions			

APPENDIX 2

Five-Step Disciplinary System

First violation:	Instruction/discussion concerning violation, proper procedures, and the hazards they control; notation for the supervisor's file.
Second violation:	Re-instruction with notation in the employee's personnel file.
Third violation:	Written warning describing the violation and actions that will be taken if it recurs.
Fourth violation:	Final warning; may include suspension.
Fifth violation:	Discharge.

It is NSE's philosophy that all employees be trained in proper safety procedures and employees are expected to follow and adhere to all aspects of NSE's Safety Process. The close observance of all Federal, local and client rules and regulations will be monitored at all times.

If there is an infraction of these rules and regulations the following disciplinary action will be taken:

Minor Infraction	Definition: Any infraction of government, corporate or client rules <u>that does not</u> have the immediate potential of causing serious damage or injury. 1 st offense – verbal warning from supervisor or management 2 nd offense – written notice with notice placed on file 3 rd offense – written notice + time off without pay 4 th offense – termination of employment
Major Infraction	Definition: Any infraction of government, corporate or client rules <u>that does</u> have the potential to cause immediate serious damage or injury. 1 st offense – time off without pay; or termination 2 nd offense – termination of employment.

NEXTSUN ENERGY, LLC

Electrical Safety Process

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NEXTSUN ENERGY, LLC

Electrical Safety Process

1. **PURPOSE**

- (a) NextSun Energy, LLC (NSE) has designed and adopted this electrical safety Process to prevent electrically related injuries to personnel resulting from either direct or indirect electrical contacts, or damage to NSE property and client facilities when work is performed near or on equipment or circuits which are or may be energized.
- (b) This process also provides for proper training of site supervisors to ensure they have the required knowledge and understanding of electrical work practices and procedures. Employees shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments.
- (c) Only employees who are qualified to perform electrical work, knowledgeable about this process, and authorized by NSE are allowed to repair or replace electrical components or electrically powered tools or equipment.
- (d) Electricity has long been recognized as a serious workplace hazard, exposing employees to such dangers as electric shock, electrocution, fires and explosions. References: NFPA 70E, Electrical Safety Requirements for Employee Workplaces, National Electrical Code (NEC) and OSHA Standard (Electrical Safety) 29 CFR 1910 Subpart S - Electrical.
- (e) Safe work practices regarding electricity shall be followed by employees as they relate to specific job assignments. Specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

2. **REFERENCE**

29 CFR 1910.332-333

3. **RESPONSIBILITIES**

- (a) Management:
 - (1) Provide training for qualified and unqualified employees
 - (2) Conduct inspections to identify electrical safety deficiencies in facilities and at job sites
 - (3) Guard and correct all electrical deficiencies promptly

- (4) Ensure all new electrical installations meet codes and regulations
- (b) Employees:
- (1) Report electrical deficiencies immediately
 - (2) ***NOT*** work on electrical equipment unless authorized and trained
 - (3) Properly inspect all electrical equipment prior to use

4. **TRAINING**

(a) Unqualified persons

Employees who face a risk of electric shock that is not reduced to a safe level by electrical installation requirements and who are not qualified persons shall also be trained in and be familiar with any electrically related safety practices that are necessary for their safety.

(b) Qualified persons

Qualified persons (i.e. those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:

- (1) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment
- (2) The skills and techniques necessary to determine the nominal voltage of exposed live parts, and
- (3) The clearance distances specified in 1910.333(c) and the corresponding voltages to which the qualified person will be exposed
- (4) An employee must have successfully completed the training required in this process for a qualified person in order to be so considered
- (5) Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials shall also have training to make them capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools
- (6) The required training shall be of the classroom or on-the-job type. The degree of training provided shall be determined by the risk to the employee
- (7) For purposes of general comparison, typical occupational employee categories that face a higher than normal risk of electrical accident include blue collar supervisors;

electrical and electronic engineers; electrical and electronic equipment assemblers; electrical and electronic technicians; electricians; industrial machine operators; material handling equipment operators; mechanics and repairers; painters; riggers and roustabouts; stationary engineers; and welders

- (8) Workers in these groups or with comparable job assignments do not need to be trained if their work or the work of those they supervise does not bring them or the employees they supervise close enough to exposed parts of electric circuits operating at 50 volts or more to ground for a hazard to exist

5. DE-ENERGIZED PARTS

- (a) If an employee is exposed to “live” energized parts or components, these shall be de-energized before the employee begins work on or near them. An exception will be if it can be demonstrated that de-energizing these parts or components will present additional or increased hazards, or if de-energizing is not feasible due to equipment design or operational limitations.
- (b) Live parts that operate at less than 50 volts to ground need not be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.
- (c) Examples of increased or additional hazards include tasks such as deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.
- (d) Examples of work that may be performed on or near energized circuit parts because of infeasibility due to equipment design or operational limitations include:
 - (1) Testing of electric circuits that can only be performed with the circuit energized, and
 - (2) Work on circuits that form an integral part of a continuous industrial process in a chemical plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment

6. ENERGIZED PARTS

- (a) If the exposed “live” parts or components are not de-energized for reasons of increased or additional hazards or infeasibility, other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved.
- (b) Such work practices shall protect employees against direct contact with energized circuit parts with any part of their body, or indirectly through some other conductive object.
- (c) The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts.

7. WORKING ON OR NEAR EXPOSED DE-ENERGIZED PARTS

- (a) This paragraph applies to work on exposed de-energized parts or near enough to them to expose the employee to any electrical hazard they present.
- (b) Conductors and parts of electric equipment that have been de-energized but have not been locked out or tagged in accordance with paragraph (b) of this section shall be treated as energized parts, and paragraph (c) of this section applies to work on or near them.

8. LOCKOUT AND TAGOUT

- (a) While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out or tagged or both in accordance with NSE's written safety procedures for the control of hazardous energy.
- (b) For the purposes of this safety policy, "fixed equipment" refers to equipment fastened in place or connected by permanent wiring methods.
- (c) NSE shall maintain a copy of the written procedures for control of hazardous energy (lockout and tagout procedures). These shall be made available for inspection by employees and by the Assistant Secretary of Labor and the Assistant Secretary's authorized representatives.

9. DE-ENERGIZING EQUIPMENT

- (a) Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment is de-energized. These procedures shall be machine-specific, system-specific or circuit-specific, in accordance with NSE's procedures for control of hazardous energy (lockout and tagout Process procedures).
- (b) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for de-energizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.
- (c) Stored electric energy which might endanger personnel shall be released.
- (d) Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel. If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as being energized.

- (e) Stored non-electrical energy in devices that could re-energize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

10. APPLICATION OF LOCKS AND TAGS

- (a) A lock and a tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed. For purposes of NSE's process, lockout only and tagout only shall not be permitted as a safe work procedure, except in accordance with NSE's written process for the control of hazardous energy for when a lock cannot be applied.
- (b) Locks shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.
- (c) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.
- (d) Selection and use of locks and tags shall be in accordance with NSE's written process for the control of hazardous energy.
- (e) If a lock cannot be applied, work shall not continue until a specific safe work procedure for the situation at hand is agreed upon between the employee and his or her on-site supervisor with approval prior to continuance of work from NSE's Safety Director.
- (f) When a lock cannot be applied, the on-site supervisor and NSE Safety Director may allow use of a tagout only when tagout is supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

11. VERIFICATION OF DE-ENERGIZED CONDITION

- (a) The requirements of this section shall be met before any circuits or equipment can be considered and worked upon as being de-energized.
- (b) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.
- (c) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized.
- (d) The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back feed even though specific parts of the circuit have been de-energized and presumed to be safe.
- (e) If the circuit to be tested is more than 600 volts, nominal, the test equipment shall be checked for proper operation immediately after this test.

12. RE-ENERGIZING EQUIPMENT

- (a) These requirements shall be met, in the order given, before circuits or equipment are re-energized, even temporarily.
- (b) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.
- (c) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.
- (d) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that:
 - (1) The employer ensures that the employee who applied the lock or tag is not available at the workplace, and
 - (2) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace
- (e) There shall be a visual determination that all employees are clear of the circuits and equipment.
- (f) All of the above procedures for reenergizing shall be done in compliance with NSE's written process for the control of hazardous energy.

13. WORKING ON OR NEAR EXPOSED ENERGIZED PARTS

- (a) This section applies to work performed on exposed live parts (involving either direct contact or by means of tools or materials), or work performed near enough so that employees are exposed to these hazards and potential exposures.
- (b) Regarding work on energized equipment, only qualified persons may work on electric circuit parts or equipment that have not been de-energized under the procedures explained in this process. Such qualified persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.
- (c) If work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.
- (d) The work practices used by qualified persons installing insulating devices on overhead power transmission or distribution lines shall be in accordance with 1910.269 and not by 1910.332 through 1910.335.
- (e) *Unqualified persons* are specifically prohibited from performing this type of work.

14. UNQUALIFIED PERSONS

- (a) When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:
 - (1) For voltages to ground 50kV or below - 10 feet (305 cm)
 - (2) For voltages to ground over 50kV - 10 feet (305 cm) plus 4 inches (10 cm) for every 10kV over 50kV
- (b) When an unqualified person is working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given in this section.
- (c) For voltages normally encountered with overhead power line, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

15. QUALIFIED PERSONS

When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in the table *Approach Distances For Qualified Employees - Alternating Current* contained in this section unless:

- (a) The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or
- (b) The energized part is insulated both from all other conductive objects at a different potential and from the person, or
- (c) The person is insulated from all conductive objects at a potential different from that of the energized part

APPROACH DISTANCES FOR QUALIFIED EMPLOYEES - ALTERNATING CURRENT

Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

16. VEHICULAR AND MECHANICAL EQUIPMENT

- (a) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

- (1) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10 kV over that voltage
 - (2) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier
 - (3) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in table *Approach Distances for Qualified Employees - Alternating Current*
- (b) Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:
- (1) The employee is using protective equipment rated for the voltage; or
 - (2) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted under this section
- (c) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistance and fault currents, which can develop within the first few feet or more outward from the grounding point.

17. ILLUMINATION

- (a) Employees may not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.
- (b) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts.
- (c) Employees may not reach blindly into areas that may contain energized parts.

18. CONFINED OR ENCLOSED WORK SPACES

When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to

prevent their swinging into an employee and causing the employee to contact exposed energized parts.

19. CONDUCTIVE MATERIALS AND EQUIPMENT

Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the employer shall institute work practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

20. PORTABLE LADDERS

Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized parts. Use of portable ladders shall comply with NSE's written safety procedures for working with ladders.

21. CONDUCTIVE APPAREL

Conductive articles of jewelry and clothing (such a watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

22. HOUSEKEEPING DUTIES

Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided. Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

23. INTERLOCKS

Only a qualified person, who is following established safe work procedures in accordance with OSHA requirements, may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

Emergency Action Plan

Purpose:

To establish the policy and procedures regarding management's and employee's response to various emergency situations. Examples of an emergency are fire, tornado, earthquake, and bomb threat.

Overview:

The procedures cover the following topics:

1. Fire Reporting and Response
2. Evacuation
3. Tornado Preparation and Emergency
4. Bomb Threat
5. First Aid
6. Hazardous Material Spill
7. Earthquake
8. Robbery

Policy:

NextSun Energy, LLC has developed plans that address emergency situations that may arise in NextSun Energy, LLC locations and which may threaten human health and safety, and damages NextSun Energy, LLC assets. Management is responsible for implementing the Emergency Action Plans. These Emergency Action Plans will meet the following objectives:

1. Provide a means of notifying employees, customers and local authorities of an emergency situation.
2. Provide for a safe and orderly method of evacuation of employees and customers from NextSun Energy, LLC premises.
3. Account for all employees who occupied NextSun Energy, LLC premises at the time of evacuation, should one occur.
4. Provide emergency first aid treatment or summon emergency medical assistance for injured individuals.
5. Provide training and needed information to those employees responsible for taking action in the event of an emergency.

Signs as required by ordinance, regulation, or law will identify emergency exits. Employees are required to be familiar with the location(s) of alarm pull stations and emergency exits.

Training on Emergency Action Plans will take place during new employee orientation, when changes occur in the action plans, and periodically as coordinated by the Safety and Health Manager.

Smoking is never allowed anywhere on NextSun Energy, LLC premises during an emergency.

If hazardous materials are involved, disposal must be done in compliance with federal, state, and local environmental laws.

Procedure:

I. Fire Reporting and Procedure:

If a fire alarm or alert is sounded or a fire is reported by an employee, regardless of the reason for the alarm or the severity of the fire, the following action must be taken immediately:

Senior Management

1. Immediately notifies the Fire Department by dialing 911 (where applicable) or the local fire emergency number:
_____ .
2. Gives NextSun Energy, LLC name, address, and area where the fire is located.
3. Assigns an employee to wait for the fire department outside NextSun Energy, LLC and direct them to the fire's location.
4. Announces evacuation instructions over the public address system. "Ladies and Gentlemen. NextSun Energy, LLC is being temporarily closed. We request that you leave by the nearest exit immediately. Thank you."
5. Once outside NextSun Energy, LLC, takes a head count of employees to insure all were safely evacuated. Double checks that all individuals are out of NextSun Energy, LLC premises.

Note: When one or more employees are unaccounted for, employees are not to re-enter the building to conduct a search. Notify the ranking fire or other emergency response official on the scene and their approximate location.

6. Immediately after the fire, notify the President of NextSun Energy, LLC and all other management individuals. Coordinate any salvage and repair operations.

Employee

7. If trained in the use of fire extinguishers, may attempt to suppress a small fire, until relieved by the Fire Department or until it becomes apparent that the fire cannot be controlled by fire extinguishers.

Note: Employees should never attempt to control a fire, which endangers their health. They must immediately evacuate the area when it becomes apparent that the fire cannot be controlled or when conditions become more hazardous.

II. Evacuation:

Senior Management

1. Telephones the local emergency agency (for example, fire, police, hazardous materials team, etc.).
2. Makes the following announcement on the public address system, "Ladies and Gentlemen. NextSun Energy, LLC is being temporarily closed. Please leave by the nearest exit immediately. Thank you." Make this announcement twice, and repeats it every minute or more frequently if needed.
3. Checks all areas of their respective departments, restrooms, and public areas to verify that employees and individuals are evacuated.
4. Secures all cash, checks, and charge documents in the safe if time permits.
5. Designates a safe area outside NextSun Energy, LLC as a gathering point for all employees. Takes a head count of employees to insure all were safely evacuated.

Note: Employees are not to re-enter the building. Management will notify the ranking fire or other emergency response official on the scene of a potentially trapped person and their approximate whereabouts.

6. Dismisses all non-essential employees.
7. Telephones the President of NextSun Energy

8. NSE and all other management personnel.

II. Tornado Preparation and Emergency:

Prior to any tornado emergency, Management will designate safe shelter areas within the building for employees and individuals. There are some general guidelines that may be used to aid in the selection of such spaces. When selecting a safe shelter, consider:

- The lowest floor, preferably a basement
- Interior spaces- rooms with no walls on the exterior
- Areas supported by secure, rigid structural frame members
- Short roof spans

NextSun Energy, LLC safe shelter area is located _____ . It will be stocked with a first aid kit or medical supplies and several flashlights.

Tornado Watch Procedures

- Senior Management
1. A Tornado Watch means that conditions are right for severe thunderstorms and possible tornadoes to develop. When notified of a tornado watch in the area, Senior Management will tune the radio to the National Weather Service channel to stay current on the storm progress.
 2. Checks to insure that all safe shelter areas are unlocked and accessible.
 3. Checks to be sure that medical supplies and flashlights are stored in the safe shelter area.
 4. If time permits, “X” the windows with tape or secure plywood to the outside of windows.

Tornado Warning Procedures

- Senior Management
1. A Tornado Warning means a tornado has been seen or detected by radar. Senior Management will inform all employees and individuals to take cover in shelter areas immediately.
 2. Makes the following announcement on the P.A. System:
“ Ladies and Gentlemen. The National Weather Service has issued a Tornado Warning for this area. Due to this warning, NextSun Energy, LLC is being

temporarily closed. Please do not leave the building. We request that you proceed to the shelter area(s) located in the name of location(s)”

3. Assigns someone to shut off the main gas and electrical system.
4. Afterwards, coordinates first aid assistance to individuals.

III. Bomb Threat:

When someone calls and says there is a bomb in the building, the following steps will be performed:

Employee
(Receiving Threat)

1. Keeps the caller on the line as long as possible. Asks them to repeat the message. Tries to write down every word spoken by the caller.
2. Asks the caller where the bomb is located and when it will go off.
3. Tells the caller that the building is occupied and detonation of a bomb could result in the death and injury to innocent people.
4. Pays particular attention to background noises, such as music playing, engine noises, etc.
5. Listens to the voice, male, female, voice quality, accent, and speech impediments.
6. When the caller hangs up, do not hang up the phone! Sometimes, phones can be traced back to the source. Immediately notify management and describe the threat.

Senior Management

7. Calls the local Police or Fire Department to report the Incident. Follows all recommendations and instructions provided by either department.
8. If the Police or Fire Department declines to give instructions to evacuate the building, search the premises (if time permits) for any suspicious looking device or package. If one is found, follow the Evacuation Plan. Do not touch any suspicious device or package.

IV. First Aid:

If an employee / individual is injured, the initial responsibility of management is to provide the needed first aid or arrange for emergency medical response or professional medical care.

Senior Management 1. Treats the injured individual using the supplies from NextSun Energy, LLC first aid kit.

2. In the event an employee is seriously injured and requires professional medical care, drive the employee to a medical provider. If any individual is not mobile or has a life threatening injury or illness, arrange for emergency care and transportation (call 911).

V. Hazardous Material Spill:

Management will respond to incidental releases of hazardous substances when the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate area or by maintenance personnel. If a large spill or fire occurs that is not controllable, Management will contact the appropriate local authorities, such as the Fire Department.

VI. Earthquake:

All employees must be aware of the potential for earthquakes and the resulting damage to buildings and facilities.

A. During an Earthquake:

Employee

1. If indoors, stay indoors; if outdoors, stay outdoors.
In earthquakes, most injuries occur as people are entering or leaving buildings.

1.a. If indoors:

- 1) Take cover beneath a desk, table, bench or in doorways, halls or against an interior wall.
- 2) Stay away from glass windows and glass doors, and away from containers having hazardous material stored.

1.b. If outdoors:

- 1) Move away from buildings and all structures, and all overhead electrical wires.
- 2) If operating a vehicle, stop as soon as possible, but stay inside the vehicle.

B. After an Earthquake:

Senior Management

1. Coordinates first aid efforts.
2. Turns on the radio to get emergency information from local authorities.
3. Check natural gas lines for leaks. If a leak is detected, shuts down the system, and notifies the local gas service company.
4. Shuts off the electrical current at the main breaker box if Power has been interrupted.
5. Directs employees and individuals to a safe assembly area outside the building.
6. Takes a head count to insure all employees were safely Evacuated.
7. Does not permit individuals to enter the building again until cleared by authorities.
8. Assigns duties to clean up damage and resume business as soon as possible.

VII. Robbery:

In the event a robbery occurs, the main objective is to reduce the risk of injury to employees and individuals and to get the robber out of the building as soon as possible.

Employee

1. Be attentive and calm. Listen to the robber and do exactly what he/she asks you to do.
2. Do give up money as demanded.
3. Remain alert. Try to remember details of the robber's appearance, clothing, speech, etc.
4. If possible, watch the robber's method and direction of escape.
5. Expect foul/strong language. Expect to lie on the floor.
6. Do not make any sudden movements.

7. Don't overreact. Do not grab for the weapon or call for help.
8. Do not argue.
9. After the robbery, write everything down.

Senior Management 10. Call the Police

11. Call the President of NextSun Energy, LLC
12. Have all witnesses write everything they can recall.

NEXTSUN ENERGY, LLC

Excavation & Trenching Safety Process

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NEXTSUN ENERGY, LLC

Excavation & Trenching Safety Process

1. **PURPOSE**

- (a) The purpose of this process is to comply with the OSHA standard guidelines for the protection of NextSun Energy, LLC employees working in and around excavations and trenches.
- (b) Compliance is mandatory to ensure employee protection when working in or around excavations. The processes in this manual on confined space, hazard communication, lockout/tagout, respiratory protection, and any other safety processes or procedures deemed essential for employee protection, are to be used in conjunction with this process.

2. **SCOPE**

The Excavation & Trenching Safety Process applies to:

- (a) NextSun Energy, LLC (NSE)
- (b) All new, transferred or rehired employees as well as temporary help under the direct day to day supervision NSE management
- (c) All NSE contractors, sub contractors, their workers and suppliers, while working under NSE contracts

3. **REFERENCE**

- (a) 29 CFR 1926.650
- (b) 29 CFR 1926.651
- (c) 29 CFR 1926.652

4. **RESPONSIBILITIES**

It is the responsibility of management and each Site Supervisor to implement and maintain the procedures and steps set forth in this process. Each employee involved with excavation and trenching work is responsible to comply with all applicable safety procedures and requirements of this process.

5. **GENERAL REQUIREMENTS**

- (a) The process establishes an excavation and trenching safety plan.
- (b) All surface encumbrances that are located at the excavation or trenching area so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.
- (c) The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.
- (d) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.
- (e) When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, NSE may proceed, provided NSE does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.
- (f) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.
- (g) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.
- (h) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.
- (i) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.
- (j) Structural members used for ramps and runways shall be of uniform thickness.
- (k) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.
- (l) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.
- (m) Means of egress from trench excavations shall be provided. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m)

or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

- (n) Employees exposed to public vehicular traffic shall be provided with and shall wear warning vests or other suitable garments marked with or made of reflector or high-visibility material.
- (o) No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.
- (p) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
- (q) An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.
- (r) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- (s) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

6. SAFE WORK PROCEDURES

Before any work is performed and before any employees enter the excavation, a number of items must be checked and insured:

- (a) Before any excavation, underground installations must be determined. This can be accomplished by either contacting the local utility companies or the local "one-call" center for the area. All underground utility locations must be documented on the proper forms. All overhead hazards (surface encumbrances) that create a hazard to employees must be removed or supported to eliminate the hazard
- (b) If the excavation is to be over 20 feet deep, it must be designed by a professional engineer who is registered in the state where work will be performed

- (c) Adequate protective systems will be utilized to protect employees. This can be accomplished through sloping, shoring, or shielding
- (d) The worksite must be analyzed in order to design adequate protection systems and prevent cave-ins. There must also be an excavation safety plan developed to protect employees
- (e) Workers must be supplied with and wear any personal protective equipment deemed necessary to assure their protection
- (f) All spoil piles will be stored a minimum of 4 feet from the sides of the excavation. The spoil pile must not block the safe means of egress
- (g) If a trench or excavation is 4 feet or deeper, stairways, ramps, or ladders will be used as a safe means of access and egress. For trenches, the employee must not have to travel any more than 25 feet of lateral travel to reach the stairway, ramp, or ladder
- (h) No employee will work in an excavation where water is accumulating unless adequate measures are used to protect the employees:
 - (1) A competent person will inspect all excavations and trenches daily, prior to employee exposure or entry, and after any rainfall, soil change, or any other time needed during the shift. The competent person must take prompt measures to eliminate any and all hazards
 - (2) Excavations and trenches 4 feet or deeper that have the potential for toxic substances or hazardous atmospheres will be tested at least daily. Documentation of test data will be maintained throughout the course of the project. If the atmosphere is inadequate, protective systems will be utilized
 - (3) If work is in or around traffic, employees must be supplied with and wear orange reflective vests. Signs and barricades must be utilized to ensure the safety of employees, vehicular traffic, and pedestrians

7. COMPETENT PERSON RESPONSIBILITIES

- (a) In most work situations, the Site Supervisor will be the competent person for excavation and trenching operations.
- (b) The OSHA Standards require that the competent person must be capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and have authorization to take prompt corrective measures to eliminate them and, if necessary, to stop the work.
- (c) A competent person is required to:

- (1) Have a complete understanding of the applicable safety standards and any other data provided
- (2) Identify the proper locations of underground installations or utilities, and ensure that the proper utility companies have been contacted
- (3) Conduct and document soil classification tests and reclassify soil after any condition changes
- (4) Determine adequate protective systems (sloping, shoring, or shielding systems) for employee protection
- (5) Conduct and document all air monitoring for potential hazardous atmospheres
- (6) Conduct and document daily and periodic inspections of excavations and trenches
- (7) Approve design of structural ramps, if used

8. EXCAVATION SAFETY PLAN

- (a) An excavation safety plan is required in written form. This plan is to be developed to the level necessary to ensure complete compliance with the OSHA Excavation Safety Standard and state and local safety standards.
- (b) Excavation safety plan factors:
 - (1) Utilization of the local one-call system
 - (2) Determination of locations of all underground utilities
 - (3) Consideration of confined space atmosphere potential
 - (4) Proper soil protection systems and personal protective equipment and clothing
 - (5) Determination of soil composition and classification
 - (6) Determination of surface and subsurface water
 - (7) Depth of excavation and length of time it will remain open
 - (8) Emergency rescue system/procedure
 - (9) Proper adherence to all other applicable OSHA Standards, this Excavation and Trenching Safety Process, and any other coinciding safety processes

9. **SOIL CLASSIFICATION AND IDENTIFICATION**

The OSHA Standards define soil classifications within the Simplified Soil Classification Systems, which consist of four categories: Stable Rock, Type A, Type B, and Type C. Stability is greatest in Stable Rock and decreases through Type A and B to Type C, which is the least stable. Appendix A of the Standard provides soil mechanics terms and types of field tests used to determine soil classifications.

(a) Stable Rock is defined as:

Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed

(b) Type A soil is defined as:

- (1) Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (TSF) or greater
- (2) Cemented soils like caliches and hardpan are considered Type A

(c) Soil is NOT Type A if:

- (1) It is fissured
- (2) The soil is subject to vibration from heavy traffic, pile driving or similar effects
- (3) The soil has been previously disturbed
- (4) The material is subject to other factors that would require it to be classified as a less stable material
- (5) The exclusions for Type A most generally eliminate it from most construction situations

(d) Type B soil is defined as:

- (1) Cohesive soil with an unconfined compressive strength greater than .5 TSF, but less than 1.5 TSF
- (2) Granular cohesion less soil including angular gravel, silt, silt loam, and sandy loam
- (3) The soil has been previously disturbed except that soil classified as Type C soil
- (4) Soil that meets the unconfined compressive strength requirements of Type A soil, but is fissured or subject to vibration

(5) Dry rock that is unstable

(e) Type C soil is defined as:

(1) Cohesive soil with an unconfined compressive strength of .5 TSF or less

(2) Granular soils including gravel, sand and loamy sand

(3) Submerged soil or soil from which water is freely seeping

(4) Submerged rock that is not stable

(f) Soil Test & Identification

(1) The competent person will classify the soil type in accordance with the definitions in Appendix A of the Standard on the basis of at least 1 visual and 1 manual analysis. These tests should be run on freshly excavated samples from the excavation and are designed to determine stability based on a number of criteria: the cohesiveness, the presence of fissures, the presence and amount of water, the unconfined compressive strength, and the duration of exposure, undermining, and the presence of layering, prior excavation and vibration.

(2) The cohesion tests are based on methods to determine the presence of clay. Clay, silt, and sand are size classifications, with clay being the smallest sized particles, silt intermediate and sand the largest. Clay minerals exhibit good cohesion and plasticity (can be molded). Sand exhibits no elasticity and virtually no cohesion unless surface wetting is present. The degree of cohesiveness and plasticity depend on the amounts of all three types and water.

(3) When examining the soil, 3 questions must be asked: Is the sample granular or cohesive? Fissured or non-fissured? What is the unconfined compressive strength measured in TSF?

(g) Methods of testing soils:

(1) Visual test: If the excavated soil is in clumps, it is cohesive. If it breaks up easily, not staying in clumps, it is granular

(2) Wet manual test: Wet your fingers and work the soil between them. Clay is a slick paste when wet, meaning it is cohesive. If the clump falls apart in grains, it is granular

(3) Dry strength test: Try to crumble the sample in your hands with your fingers. If it crumbles into grains, it is granular. Clay will not crumble into grains, only into smaller chunks

(4) Pocket penetrometer test: This instrument is most accurate when soil is nearly saturated. This instrument will give unconfined compressive strength in tons per

square foot. The spring-operated device uses a piston that is pushed into a coil up to a calibration groove. An indicator sleeve marks and retains the reading until it is read. The reading is calibrated in tons per square foot (TSF) or kilograms per cubic centimeter

- (5) Thumb penetration test: The competent person attempts to penetrate a fresh sample with thumb pressure. If the sample can be dented, but penetrated only with great effort, it is Type A. If it can be penetrated several inches and molded by light pressure, it is Type C. Type B can be penetrated with effort and molded
- (6) Shear vane: Measures the approximate shear strength of saturated cohesive soils. The blades of the vane are pressed into a flat section of undisturbed soil, and the knob is turned slowly until soil failure. The dial is read directly when using the standard vane. The results will be in tons per square foot or kilograms per cubic centimeter
- (7) The competent person will perform several tests along the depth and length of the excavation to obtain consistent, supporting data. The soil is subject to change several times within the scope of an excavation and the moisture content will vary with weather and job conditions. The competent person must also determine the level of protection based on what conditions exist at the time of the test, and allow for changing conditions

10. HAZARDOUS ATMOSPHERES

To prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

- (a) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth
- (b) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation
- (c) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas
- (d) When controls are used that is intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe
- (e) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist

or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use

- (f) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation

11. WATER ACCUMULATION

- (a) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.
- (b) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.
- (c) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with provisions of the two paragraphs above.

12. EXCAVATION PROTECTION SYSTEMS

- (a) The three basic protective systems for excavations and trenches are sloping and benching systems, shoring, and shields.
- (b) The protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied to or transmitted to the system. Every employee in an excavation shall be protected from cave-ins by an adequate protective system.
- (c) Exceptions to using protective system:
 - (1) Excavations are made entirely in stable rock
 - (2) Excavations are less than 5 feet deep and declared safe by a competent person
- (d) Sloping and Benching Systems
 - (1) There are 4 options for sloping:

- (i) Slope to the angle required by the Standard for Type C soil, which is the most unstable soil type
 - (ii) The table provided in Appendix B of the Standard may be used to determine the maximum allowable angle (after determining the soil type)
 - (iii) Tabulated data prepared by a registered professional engineer can be utilized
 - (iv) A registered professional engineer can design a sloping plan for a specific job
- (2) Sloping and benching systems for excavations 5 to 20 feet in depth must be constructed under the instruction of a designated competent person.
 - (3) Sloping and benching systems for excavations greater than 20 feet must be designed and stamped by a registered professional engineer.
 - (4) Sloping and benching specifications can be found in Appendix B of the Standard.

(e) Shoring Systems

- (1) Shoring is another protective system or support system. Shoring utilizes a framework of vertical members (uprights), horizontal members (whales), and cross braces to support the sides of the excavation to prevent a cave-in. Metal hydraulic, mechanical or timber shorings are common examples.
- (2) Different examples of shoring are found in the OSHA Standard under these appendices:
 - (i) **Appendix C** - Timber Shoring for Trenches
 - (ii) **Appendix D** - Aluminum Hydraulic Shoring for Trenches
 - (iii) **Appendix E** - Alternatives to Timber Shoring

(f) Shield Systems (Trench Boxes)

- (1) Shielding is the third method of providing a safe workplace. Unlike sloping and shoring, shielding does not prevent a cave-in. Shields are designed to withstand the soil forces caused by a cave-in and protect the employees inside the structure. Most shields consist of 2 flat, parallel metal walls that are held apart by metal cross braces. Shielding design and construction is not covered in the OSHA Standards. Shields must be certified in design by a registered professional engineer and must have either a registration plate on the shield or registration papers from the manufacturer on file at the jobsite office.

Note: Any repairs or modifications MUST be approved by the manufacturer.

(2) Safety Precautions For Shield Systems

- (i) Shields must not have any lateral movement when installed.
- (ii) Employees will be protected from cave-ins when entering and exiting the shield (examples - ladder within the shield or a properly sloped ramp at the end).
- (iii) Employees are not allowed in the shield during installation, removal, or during any vertical movement.
- (iv) Shields can be 2 ft. above the bottom of an excavation if they are designed to resist loads at the full depth and if there are no indications of caving under or behind the shield.
- (v) The shield must extend at least 18 inches above the point where proper sloping begins (the height of the shield must be greater than the depth of the excavation).
- (vi) The open end of the shield must be protected from the exposed excavation wall. The wall must be sloped, shored, or shielded. Engineer designed end plates can be mounted on the ends of the shield to prevent cave-ins.

13. **PERSONAL PROTECTIVE EQUIPMENT**

It is NSE policy to wear a hard hat, safety glasses, and work boots on the jobsite. Because of the potential hazards involved with excavations, other personal protective equipment may be necessary (examples - goggles, gloves, safety harness and lifeline, and respiratory equipment).

14. **INSPECTIONS**

Daily inspection of excavations, the adjacent areas and protective systems shall be made by the competent person for evidence of a situation that could result in a cave-in, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions.

- (a) All inspections shall be conducted by the competent person prior to the start of work and as needed throughout the shift.
- (b) Inspections will be made after every rainstorm or any other increasing hazard.
- (c) All documented inspections will be kept on file in the jobsite safety files.
- (d) A copy of the *Daily Excavation Checklist* is located at the end of this process.

15. **TRAINING**

- (a) When NSE is not initiating the excavation or trenching operation, basic awareness training shall be provided by communicating all elements of this process to employees at the work location.
- (b) The competent person(s) must be trained in accordance with the OSHA Excavation Standard, and all other processes that may apply (examples Hazard Communication, Confined Space, and Respiratory Protection), and must demonstrate a thorough understanding and knowledge of the processes and the hazards associated.
- (c) All other employees working in and around the excavation must be trained in the recognition of hazards associated with trenching and excavating.

APPENDIX 1

DAILY EXCAVATION CHECKLIST

Client: _____ Project Name: _____ Project Location: _____

Job #: _____ Date: _____ Time: _____ Temp: _____ Wind Dir: _____

Safety Rep: _____ Soil Classification: _____ Competent Person: _____

Excavation Size: Length: _____ Width: _____ Depth: _____ Protective System Used: _____

Excavation > 4 feet deep? _____ Yes* _____ No

*NOTE: If *YES*, complete a Confined Space Permit BEFORE any person enters the excavation.
Trenches over 4 feet in depth are considered excavations.

Any item below marked *NO* must be corrected or controlled BEFORE any person enters the excavation.

YES	NO	N/A	POTENTIAL HAZARD
			GENERAL
			Employees protected from cave-ins & loose rock/soil that could roll into the excavation?
			Spoils, materials & equipment set back at least 4 feet from the edge of the excavation?
			Engineering designs for shoring &/or manufacturer's design specifications for trench box on site?
			Adequate signs posted and barricades provided?
			Training (toolbox meeting) conducted w/ employees prior to entering excavation?
			UTILITIES
			Utility company contacted & given 24 hours notice &/or utilities already located & marked?
			Overhead lines located, noted and reviewed with the operator?
			Utility locations reviewed with the operator & precautions taken to protect against contact?
			Utilities crossing the excavation supported, and protected from falling materials?
			Underground installations protected, supported or removed when excavation is open?
			WET CONDITIONS
			Precautions taken to protect employees from water accumulation (continuous dewatering)?
			Surface water or runoff diverted / controlled to prevent accumulation in the excavation?
			Inspection made after every rainstorm or other hazard increasing occurrence?
			HAZARDOUS ATMOSPHERES
			Air in the excavation tested for oxygen deficiency, combustibles, other contaminants?
			Atmospheric hazards present?
			Ventilation used in hazardous atmospheres?
			Emergency equipment available where hazardous atmospheres could or do exist?
			Safety harness and lifeline used?
			Supplied air necessary (if yes, contact safety department)?
			ENTRY & EXIT
			Exit (i.e. ladder, sloped wall) no further than 25 feet from ANY employee?
			Ladders secured and extend 3 feet above the edge of the trench?
			Wood ramps constructed of uniform material thickness and cleated together at the bottom?
			Employees protected from cave-ins when entering or exiting the excavation?

KEEP 1 COPY OF EACH DAILY EXCAVATION CHECKLIST ON SITE FOR THE PROJECT DURATION

APPENDIX 2

DEFINITIONS

1. **BENCHING** - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.
2. **CAVE-IN** - The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by failing or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
3. **COMPETENT PERSON** - One who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
4. **DURATION OF EXPOSURE** - The longer an excavation is open, the longer the other factors have to work on causing it to collapse.
5. **EXCAVATION** - Any man-made cut, trench, or depression in an earth surface, formed by earth removal.
6. **HAZARDOUS ATMOSPHERE** - An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.
7. **PROTECTIVE SYSTEM** - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide necessary protection.
8. **SHIELD** - A structure that is capable of withstanding the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields can be pre-manufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields are also referred to as "trench boxes" or "trench shields."
9. **SLOPING** - A method of protecting workers from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences such as soil type, length of exposure, and application of surcharge loads.
10. **SURCHARGE LOADS** - Generated by the weight of anything in proximity to the excavation, push starts for a cave-in (anything up top pushing down). Common surcharge loads:

- a. weight of spoil pile
 - b. weight of nearby buildings, poles, pavement, or other structural objects.
 - c. weight of material and equipment
11. TRENCH - A narrow excavation below the surface of the ground, less than 15 feet wide, with a depth no greater than the width.
12. UNDERMINING - Undermining can be caused by such things as leaking, leaching, caving or over-digging. Undermined walls can be very dangerous.
13. VIBRATION - A force present on construction sites and must be considered. The vibrations caused by backhoes, dump trucks, compactors and traffic on job sites can be substantial.

NEXTSUN ENERGY, LLC

Fall Protection Process

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NEXTSUN ENERGY, LLC

Fall Protection Process

1. **PURPOSE**

This process sets forth requirements and criteria for fall protection in construction workplaces covered within 29 CFR Part 1926.

Exception: The provisions of this process do not apply when employees are making an inspection, investigation, or assessment of workplace conditions prior to the actual start of construction work or after all construction work has been completed.

2. **SCOPE**

This Fall Protection process applies to:

- d. NextSun Energy, LLC (NSE)
- e. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management
- f. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts

3. **REFERENCES**

29 CFR 1926.500

4. **GENERAL**

- (a) Fall protection is required whenever employees are potentially exposed to falls from heights of 6 feet or greater to lower levels. This includes work near and around excavations.
- (b) Use of guard rails, safety net, or personal fall arrest systems shall be used as methods of fall protection when standard methods are not feasible or a greater hazard would be created by use of standard methods. Determination of employee exposure to fall hazards shall be made without regard for the use of personal protective equipment.
- (c) Scaffolds, ladders or vehicle mounted work platforms may be utilized at a work location so long as employees have been sufficiently trained in the safe use of these devices and are authorized by the Site Supervisor for such work. Use of vehicle-mounted work

- platforms and scaffolding requires specific training for individual in charge of the work and users.
- (d) The Site Supervisor, in conjunction with NSE's Safety Director, shall determine if the walking or working surfaces on which employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.
 - (e) Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.
 - (f) Each employee who is constructing a leading edge 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems. Exception: When the Site Supervisor can demonstrate that it is infeasible or creates a greater hazard to use these systems, the Site Supervisor, in conjunction with NSE's Safety Director, shall develop and implement a fall protection plan which meets the requirements of paragraph (k) of 1926.502.
 - (g) Each employee on a walking/working surface 6 feet (1.8 m) or more above a lower level where leading edges are under construction, but who is not engaged in the leading edge work, shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access zone has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.
 - (h) Each employee in a hoist area shall be protected from falling 6 feet (1.8 m) or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, [or chain, gate, or guardrail] or portions thereof, are removed to facilitate the hoisting operation (e.g., during landing of materials), and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee shall be protected from fall hazards by a personal fall arrest system.
 - (i) Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes.
 - (j) Each employee on a walking/working surface shall be protected from tripping in or stepping into or through holes (including skylights) by covers.
 - (k) Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by covers.
 - (l) Each employee on the face of formwork or reinforcing steel shall be protected from falling 6 feet (1.8 m) or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems.

- (m) Each employee on ramps, runways, and other walkways shall be protected from falling 6 feet (1.8 m) or more to lower levels by guardrail systems.
- (n) Each employee at the edge of an excavation 6 feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other vision barrier.
- (o) Each employee at the edge of a well, pit, shaft, and similar excavation 6 feet (1.8m) or more in depth shall be protected from falling by guardrail systems, fences, barricades, or covers.
- (p) Each employee less than 6 feet (1.8 m) above dangerous equipment shall be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guards.
- (q) Each employee 6 feet (1.8 m) or more above dangerous equipment shall be protected from fall hazards by guardrail systems, personal fall arrest systems, or safety net systems.
- (r) Each employee reaching more than 10 inches (25 cm) below the level of the walking/working surface on which they are working shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system.
- (s) Each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system. Or, on roofs 50-feet (15.25 m) or less in width the use of a safety monitoring system alone [i.e. without the warning line system] is permitted.
- (t) Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems with toe boards, safety net systems, or personal fall arrest systems.
- (u) Each employee engaged in the erection of pre-cast concrete members (including, but not limited to the erection of wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of pre-cast concrete members, who is 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems.
- (v) Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet (1.8 m) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0 m) above the walking/working surface, shall be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.
- (w) When an employee is exposed to falling objects, each employee shall wear a hard hat and the Site Supervisor shall implement one of the following measures:

- (1) Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels; or
 - (2) Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced; or
 - (3) Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced
- (x) When fall protection is required for the protection of employees, a fall protection plan shall be prepared by a qualified person and developed specifically for the site where the work is being performed. The plan must be maintained up to date.
- (y) When fall protection is required, a competent person shall be assigned to: recognize fall hazards; warn employees if they are unaware of a fall hazard or are acting in an unsafe manner; be on same working surface and in visual sight; stay close enough for verbal communication; and not have other assignments that would distract the monitor's attention from the monitoring responsibilities.
- (z) When purchasing equipment and raw materials for use in fall protection systems applicable ANSI and ASTM requirements shall be met.

5. **GUARDRAIL SYSTEMS**

- (a) Top edge height of top rails, or equivalent guardrail system members, shall be 42 inches (1.1 m) plus or minus 3 inches (8 cm) above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this paragraph.
- (b) Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (53 cm) high.
- (c) Midrails, when used, shall be installed at a height midway between the top edge of the guardrail system and the walking/working level.
- (d) Screens and mesh, when used, shall extend from the top rail to the walking/working level and along the entire opening between top rail supports.

- (e) Intermediate members (such as balusters), when used between posts, shall be not more than 19 inches (48 cm) apart. Other structural members (such as additional midrails and architectural panels) shall be installed so that there are no openings in the guardrail system that are more than 19 inches (.5 m) wide.
- (f) Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied within 2 inches (5.1 cm) of the top edge, in any outward or downward direction, at any point along the top edge.
- (g) Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds (666 N) applied in any downward or outward direction at any point along the mid-rail or other member.
- (h) Guardrail systems shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
- (i) The ends of all top rails and midrails shall not overhang the terminal posts, except where such overhang does not constitute a projection hazard.
- (j) Steel banding and plastic banding shall not be used as top rails or midrails.
- (k) Top rails and midrails shall be at least one-quarter inch (0.6 cm) nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it shall be flagged at not more than 6-foot intervals with high-visibility material.
- (l) When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.
- (m) When guardrail systems are used at holes, they shall be erected on all unprotected sides or edges of the hole.
- (n) When guardrail systems are used around holes used for the passage of materials, the hole shall have not more than two sides provided with removable guardrail sections to allow the passage of materials. When the hole is not in use, it shall be closed over with a cover, or a guardrail system shall be provided along all unprotected sides or edges.
- (o) When guardrail systems are used around holes which are used as points of access (such as ladder ways), they shall be provided with a gate, or be so offset that a person cannot walk directly into the hole.
- (p) Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge.
- (q) Manila, plastic or synthetic rope being used for top rails or midrails shall be inspected as frequently as necessary to ensure that it continues to meet the strength requirements of paragraph 3.6 of this section.

(r) Safety nets may be used only after approval by NSE Safety Director.

6. **PERSONAL FALL ARREST SYSTEMS**

- (a) Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
- (b) Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.
- (c) D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds (22.2 kN).
- (d) Snap hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook by depression of the snap hook keeper by the connected member, or shall be a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member. Effective January 1, 1998, only locking type snap hooks shall be used.
- (e) Unless the snap hook is a locking type and designed for the following connections, snap hooks shall not be engaged:
 - (1) Directly to webbing, rope or wire rope
 - (2) To each other
 - (3) To a d-ring to which another snap hook or other connector is attached
 - (4) To a horizontal lifeline; or
 - (5) To any object which is incompatibly shaped or dimensioned in relation to the snap hook such that unintentional disengagement could occur by the connected object being able to depress the snap hook keeper and release itself
- (f) On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.
- (g) Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
- (h) Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds (22.2 kN).

- (i) Lifelines shall be protected against being cut or abraded.
- (j) Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less shall be capable of sustaining a minimum tensile load of 3,000 pounds (13.3 kN) applied to the device with the lifeline or lanyard in the fully extended position.
- (k) Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, rip stitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds (22.2 kN) applied to the device with the lifeline or lanyard in the fully extended position.
- (l) Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses shall be made from synthetic fibers.
- (m) Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, or shall be designed, installed, and used as follows:
 - (1) As part of a complete personal fall arrest system which maintains a safety factor of at least two; and
 - (2) Under the supervision of a qualified person
- (n) The attachment point of the body belt shall be located in the center of the wearer's back. The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head.
- (o) Harnesses and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.
- (p) Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by NSE's Safety Director to be undamaged and suitable for reuse.
- (q) Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.
- (r) Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists.
- (s) **RESCUE OPERATIONS**
 - (1) A post-fall recovery plan will be developed.
 - (2) Rescue equipment must be on site and inspected prior to employees engaging in elevated work.

- (3) Inventory useful tools (ladders, man-lifts, hoists, rescue winches, etc.) and their location before a fall occurs
- (4) Locate all emergency response location prior to performing work.
- (5) Determine if emergency response rescue equipment is feasible in the event of an emergency.
- (6) Avoid further injuries and falls by providing fall protection for both rescuer and subject.
- (7) All rescue procedures are to be covered in the daily JSA.

7. **POSITIONING DEVICE SYSTEMS**

- (a) Positioning devices shall be rigged so that an employee cannot free fall more than 2 feet (.9 m).
- (b) Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.
- (c) Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration and defective components shall be removed from service.

8. **WARNING LINE SYSTEMS**

Warning line systems may be used only after approval by NSE Safety Director.

9. **CONTROLLED ACCESS ZONES**

- (a) The fall protection plan shall identify each location where conventional fall protection methods cannot be used. These locations shall then be classified as controlled access zones.
- (b) When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.
- (c) When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge, except when erecting pre-cast concrete members.
 - (1) When erecting pre-cast concrete members, the control line shall be erected not less than 6 feet (1.8 m) nor more than 60 feet (18 m) or half the length of the member being erected, whichever is less, from the leading edge.

- (2) The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.
 - (3) The control line shall be connected on each side to a guardrail system or wall.
- (d) When used to control access to areas where overhand bricklaying and related work are taking place:
- (1) The controlled access zone shall be defined by a control line erected not less than 10 feet (3.1 m) nor more than 15 feet (4.5 m) from the working edge.
 - (2) The control line shall extend for a distance sufficient for the controlled access zone to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge.
 - (3) Additional control lines shall be erected at each end to enclose the controlled access zone.
 - (4) Only employees engaged in overhand bricklaying or related work shall be permitted in the controlled access zone.
- (e) Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
- (1) Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
 - (2) Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) [50 inches (1.3 m) when overhand bricklaying operations are being performed] from the walking/working surface.
 - (3) Each line shall have a minimum breaking strength of 200 pounds (.88 kN).
- (f) On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, controlled access zones shall be enlarged, as necessary, to enclose all points of access, material handling areas, and storage areas.
- (g) On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed and the employer must comply with the criteria in paragraph (g) of this section.
- (h) Controlled access zones may be used only after approval by NSE Safety Director.

10. SAFETY MONITORING SYSTEMS

- (a) Where no other alternative measure has been implemented, the employer shall implement a safety monitoring system in conformance with 1926.502(h).
- (b) Safety monitoring systems and their use shall comply with the following provisions
 - (1) The employer shall designate a competent person to monitor the safety of other employees and the employer shall ensure that the safety monitor complies with the following requirements:
 - (i) The safety monitor shall be competent to recognize fall hazards
 - (ii) The safety monitor shall warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner
 - (iii) The safety monitor shall be on the same walking/working surface and within visual sighting distance of the employee being monitored
 - (iv) The safety monitor shall be close enough to communicate orally with the employee; and
 - (v) The safety monitor shall not have other responsibilities which could take the monitor's attention from the monitoring function
 - (2) Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-slope roofs.
 - (3) No employee, other than an employee engaged in roofing work [on low-sloped roofs] or an employee covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.
 - (4) Each employee working in a controlled access zone shall be directed to comply promptly with fall hazard warnings from safety monitors.
- (c) Safety monitoring systems may be used only after approval by NSE Safety Director.

11. COVERS

Covers for holes in floors, roofs, and other walking/working surfaces shall meet the following requirements:

- (a) Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover

- (b) All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time
- (c) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees
- (d) All covers shall be color coded or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard

12. **TRAINING**

- (a) NSE provides a training process for each employee who might be exposed to fall hazards. Training shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to follow to minimize these hazards.
- (b) Training shall be documented with written certification records showing the name of the person trained, time and date(s) of training, and the signature of the trainer. Record shall also be made of the date on which NSE determined training was adequate.
- (c) Re-training shall be conducted when deficiencies in training are noted, or procedures in the work change, and / or when fall protection systems or equipment modifications and changes render previous training obsolete.
- (d) The Site Supervisor shall assure that a training process is in place for each employee who might be exposed to fall hazards. The process shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.
- (e) The Site Supervisor shall assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:
 - (1) The nature of fall hazards in the work area
 - (2) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used
 - (3) The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protection to be used
 - (4) The role of each employee in the safety monitoring system when this system is used
 - (5) The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs

- (6) The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
- (7) The role of employees in fall protection plans; and
- (8) The standards contained in 29 CFR 1926 Subpart M
- (f) The Site Supervisor shall verify compliance by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training.
- (g) When the Site Supervisor has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by this process, the Site Supervisor shall ensure that each such employee is retrained.

13. INCIDENT INVESTIGATION

In the event an employee falls, or some other related, serious incident occurs, (e.g., a near miss) the employer shall investigate the circumstances of the fall or other incident to determine if the fall protection plan needs to be changed (e.g. new practices, procedures, or training) and shall implement those changes to prevent similar types of falls or incidents.

APPENDIX 1

DEFINITIONS

1. "Anchorage" means a secure point of attachment for lifelines, lanyards or deceleration devices.
2. "Body belt (safety belt)" means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.
3. "Body harness" means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.
4. "Buckle" means any device for holding the body belt or body harness closed around the employee's body.
5. "Connector" means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or Dee-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).
6. "Controlled access zone (CAZ)" means an area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.
7. "Dangerous equipment" means equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.
8. "Deceleration device" means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.
9. "Deceleration distance" means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.
10. "Equivalent" means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

11. "Failure" means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.
12. "Free fall" means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.
13. "Free fall distance" means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
14. "Guardrail system" means a barrier erected to prevent employees from falling to lower levels.
15. "Hole" means a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.
16. "Infeasible" means that it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.
17. "Lanyard" means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.
18. "Leading edge" means the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.
19. "Lifeline" means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
20. "Low-slope roof" means a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
21. "Lower levels" means those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.
22. "Mechanical equipment" means all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mop carts.

23. "Opening" means a gap or voids 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.
24. "Personal fall arrest system" means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.
25. "Positioning device system" means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.
26. "Rope grab" means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.
27. "Roof" means the exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily becomes the top surface of a building.
28. "Roofing work" means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.
29. "Safety-monitoring system" means a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
30. "Self-retracting lifeline/lanyard" means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.
31. "Snap hook" means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap hooks are generally one of two types:
 32. The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or
 33. The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snap hook as part of personal fall arrest systems and positioning device systems is prohibited.
34. "Steep roof" means a roof having a slope greater than 4 in 12 (vertical to horizontal).
35. "Toe board" means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

36. "Unprotected sides and edges" means any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.
37. "Walking/working surface" means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.
38. "Warning line system" means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.
39. "Work area" means that portion of a walking/working surface where job duties are being performed.

NEXTSUN ENERGY, LLC

Fire Protection Process

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NEXTSUN ENERGY, LLC

Fire Protection Process

1. **PURPOSE**

The purpose of this NextSun Energy, LLC process is to outline prevention and protective measures which should be taken to ensure protection of personnel, property, and the environment from a fire incident.

2. **SCOPE**

This Fire Protection process applies to:

- g. NextSun Energy, LLC (NSE)
- h. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- i. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **REFERENCE**

- (a) 29 CFR 1926.24
- (b) 29 CFR 1926.150-.155

4. **FIRE PREVENTION**

- (a) Electrical wiring and equipment for light, heat or power purposes must be installed in accordance with the national electric code. The proper type and size of fuses shall be used at all times. All equipment and portable tools are to be grounded. Explosion proof fixtures are required in hazardous classified locations.
- (b) Housekeeping - Remove trash daily from the work areas and from the work site. Use trash drums to reduce extra handling. Put rags in closed containers. Rags used for solvent cleaning should be kept in a closed metal container until properly disposed of.

- (c) Compressed Gas Cylinder – Separate the full cylinders from "empty" cylinders in storage. Keep oxygen cylinders separate from fuel cylinders by 20 feet, or by a fire resistant barrier. Tie cylinders in a vertical position. Keep oil and grease away from oxygen valves. Turn cylinders off when not in use. Protect cylinders from excess heat (sun, open flame, equipment exhausts, sparks slag, etc.) No cylinder storage inside buildings.
- (d) Gasoline and Diesel Pumps - Service station type pumps require physical barriers to prevent damage to the pumps. "No Smoking or Open Flame" signs are also necessary. Dispensing nozzles shall be of an approved type.
- (e) Internal Combustion Engines - Turn off engine before refueling, and allow a minimum of fifteen (15) minutes for engine to cool off. Insulate exhaust stacks near combustible material. Keeps exhaust discharge away from flammable liquids (particularly truck exhausts)
- (f) Material Storage - Outside - Storage areas containing combustible material (lumber, etc.), or non-combustible material in combustible containers (metal parts in wooden boxes) need to be separated from other material by at least 20 feet on all sides to help prevent the spread of fire and to allow fire equipment access. A single storage area cannot be larger than 50 by 150 feet. All weeds, dead grass, and combustible trash need to be kept out of the storage areas and out of access ways.
- (g) No Smoking or Open Flame Areas and Signs - Areas where flammable liquids are stored or dispensed need to be clearly identified. "NO SMOKING OR OPEN FLAME" signs need to be posted no more than 25 feet away from the hazard. Areas containing large quantities of combustible materials should also be identified and marked with the same signs. Cigarette butt cans will help prevent careless disposal of smoking materials.
- (h) Open Flames - Welding torches, matches, heaters, and other open flames have caused many unnecessary fires. Check the area for possible hazards before lighting up.
- (i) Sparks and Slag - To avoid a fire, move flammable or combustible materials before starting to weld or burn. If material cannot be moved, cover it with fire retardant material.
- (j) Tarps and Plastic Coverings - Tarps must be fire retardant. Plastic sheets must be flame resistant if they are to be used with flame or high heat operations. Tie tarps and plastic securely so they cannot blow loose.
- (k) Temporary Heating Devices - No open burning of trash. Propane heating units need automatic fuel shut-off valves. Oil salamanders must be cool before being refilled, or being moved. All heaters need good clearance or non-combustible insulation on all sides, top and bottom.
- (l) A temporary building shall not be erected where it will adversely affect any means of exit.

- (m) No combustible material shall be stored within 10 feet of a building or structure.
- (n) Roadways and access to storage areas must be maintained to accommodate the widest vehicle that may be used for fire fighting purposes.
- (o) Material shall not be stored within 36 inches of a fire door opening.

5. FLAMMABLE AND COMBUSTIBLE LIQUID STORAGE

Only approved containers and portable tanks shall be used for storage and handling.

- (a) Flammable Liquids - All - Liquids with a flash point below 140 degrees F are referred to as "flammable liquids." Store in original containers until needed. All tanks, drums, containers, cans and cabinets are to be electrically grounded and labeled with the name of the material. Do not mix contents and labels. Handle small quantities (5 gallon maximum) in "safety cans." Two main features of a safety can are a spring-loaded cap and a flame arrester.
- (b) Flammable or Combustible Liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of personnel.

6. INDOOR STORAGE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS

- (a) No more than 25 gallons of flammable or combustible liquids are to be stored inside a building unless stored in an approved storage cabinet and labeled "flammable - keep fire away."
- (b) No more than 60 gallons of flammable or 120 gallons of combustible liquids may be stored inside of a single storage cabinet inside a building. No more than 3 storage cabinets are allowed in a single building when containing the maximum amount allowed.
- (c) Quantities of flammable or combustible liquids stored inside a building which exceed the amount of three storage cabinets must be stored in an approved storage room which meets the applicable requirements of The National Fire Protection Association. An aisle space of three feet wide must be maintained at all times in inside storage rooms.
- (d) Materials which react with water shall not be stored in the same location as flammable or combustible liquids. A separate storage area should be provided for water reactive materials and they should be conspicuously marked as such.
- (e) Electrical wiring and equipment located in inside flammable and combustible liquid storage rooms shall be approved for hazardous locations.

7. STORAGE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS OUTSIDE OF BUILDINGS

No more than 1,100 gallons of flammable or combustible liquids may be stored in any one outside storage area unless separated by a minimum aisle space of 5 feet. Groups of containers shall not be nearer than 20 feet to a building. Each container or outside storage area must be accessible by a 12 foot wide access for a maximum distance of 200 feet.

8. HANDLING FLAMMABLE AND COMBUSTIBLE LIQUIDS

- (a) Dispensing of flammable or combustible liquids from one container to another shall be separated from other operations by a distance of not less than 25 feet.
- (b) Containers shall be bonded when transferring flammable liquids from one container to another.
- (c) Approved self-closing valves shall be used for dispensing of flammable or combustible liquids.
- (d) Flammable or combustible liquids shall be drawn or transferred by either gravity or pump only. Never transfer by means of air pressure on the container or portable tank.
- (e) Flammable liquids shall be kept in closed containers when not actually in use.
- (f) Precautions shall be taken to eliminate leakage or spillage of flammable and combustible liquids where necessary such as the use of funnels.
- (g) Leakage or spillage from flammable and combustible liquids must be promptly cleaned up and properly disposed of.

9. TRAINING

- (a) Where NSE has provided portable fire extinguishers for employees use in the workplace, training shall be provided to educate and familiarize employees with the general principles of fire extinguisher use, the hazards involved in incipient stage fire fighting, and general safe use of the extinguisher.
- (b) Work environments, classified as hot work, sometimes require the use of a trained fire watch. Whenever personnel are assigned as fire watch they shall be properly trained. Fire watches are to be at the site prior to beginning hot work and thirty minutes after hot work is complete.
- (c) Fire extinguisher training shall be conducted when the employee is initially assigned and at least annually thereafter.

10. FIRE EXTINGUISHERS - MOUNTING AND ACCESS

- (a) Extinguishers are not to be left on the floor, or a scaffold, or on the ground. They are to be mounted on a wall, handrail, barricade, etc.
- (b) Extinguishers that have a total weight of more than 40 pounds are to be mounted with the top of the extinguisher no more than 42 inches above the floor. Extinguishers weighing 40 pounds or less may be mounted with the top as high as 5 feet above the floor. (Mounting all extinguishers at the 42 inch height is a good habit.)
- (c) Extinguishers should be located where they can be easily seen. In cases where this is not practical, signs or red paint marking, need to be added to identify the location of the extinguisher.
- (d) Keep trash and stored material away from extinguishers to prevent blockage of the access to the extinguisher.

11. FIRE EXTINGUISHERS - INSPECTION AND TESTING

- (a) NSE shall ensure that portable fire extinguishers are visually inspected at least monthly and inspected annually as part of a thorough maintenance check of the integrity of the device.
- (b) Portable fire extinguishers shall be given an annual maintenance check to ensure integrity of the device. Stored pressure extinguishers do not require an internal examination. A written record shall be made of the annual maintenance date. This record shall be retained for one year after the last entry or the life of the shell, whichever is less. The record shall be available to the Assistant Secretary upon request.
- (c) Every fire extinguisher is to be visually inspected at least once a month. The inspection is to include:
 - (1) Proper location
 - (2) Fully charged
 - (3) Seal wire not broken
 - (4) Free of any obvious defects or damage
 - (5) Inspection tag is current
 - (6) Annual inspections:
- (d) A thorough examination of each extinguisher shall be conducted annually by an individual trained to examine, repair, and recharge extinguishers. An inspection tag is to be

attached to each extinguisher showing the date of the annual examination, the date of the recharge, and the initials of the individual making the examination.

- (e) Extinguishers more than 5 years old may need a hydrostatic test if they are to remain in service.

NEXTSUN ENERGY, LLC

First Aid, CPR & Emergency Medical Response Process

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NEXTSUN ENERGY, LLC

First Aid, CPR & Emergency Medical Response Process

1. **PURPOSE**

- (a) Personal injury is not uncommon in the pipeline construction and maintenance workplace. These injuries are usually minor cuts or burns but can be as severe as acute effects of chemical exposure or incidents such as heart attacks or strokes.
- (b) This written plan and policy, along with accompanying materials, shall be utilized by Site Supervisors and NSE employees to ensure that medical services and first aid are available at each job location.

2. **SCOPE**

This First Aid, CPR & Emergency Medical Response process applies to:

- j. NextSun Energy, LLC (NSE)
- k. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- l. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **REFERENCE**

29 CFR 1926.50

4. **GENERAL REQUIREMENTS**

- (a) NSE shall ensure the availability of medical personnel for advice and consultation on matters of occupational health.
- (b) Provisions shall be made prior to commencement of the project for prompt medical attention in case of serious injury.
- (c) In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, which is available for the treatment of injured employees, a person who has a valid certificate in first aid training from the U.S.

- Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the worksite to render first aid.
- (d) First aid supplies shall be easily accessible when required.
 - (e) The contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item, and shall be checked by NSE Safety Director before being sent out on each job, and at least weekly on each job by the Site Supervisor to ensure that the expended items are replaced.
 - (f) First aid supplies shall be readily available.
 - (g) An example of the minimal contents of a generic first aid kit is described in American National Standard (ANSI) Z308.1-1978 "Minimum Requirements for Industrial Unit-Type First-aid Kits." The contents of the kit listed in the ANSI standard should be adequate for small worksites. When larger operations or multiple operations are being conducted at the same location, employers should determine the need for additional first aid kits at the worksite, additional types of first aid equipment and supplies and additional quantities and types of supplies and equipment in the first aid kits.
 - (h) Work locations may have unique or changing first aid needs and may need to enhance the first aid kits maintained at these locations.
 - (i) In areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances shall be conspicuously posted by the Site Supervisor. *See Emergency Phone List form at Appendix 1 of this section.*
 - (j) Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Quick drenching may be accomplished by use of portable eyewash and body wash stations, or stations designed for this purpose that are plumbed into an appropriate water supply.

5. FIRST AID & EMERGENCY MEDICAL RESPONSE

- (a) Proper equipment for prompt transportation of the injured person to a physician or hospital, or a communication system for contacting necessary ambulance service, shall be provided. The Site Supervisor shall be responsible for confirming the availability of emergency medical services assistance should they be needed, and confirming that arrangements are in place for transporting injured persons to a physician or hospital.
- (b) In most situations communication to obtain emergency medical assistance will be provided by land-line telephone, cellular telephone or two-way radio. The Site Supervisor shall ensure that such communications capabilities are available at the jobsite prior to commencing work.
- (c) The initial responsibility for first aid rests with the first person(s) at the scene, who should react quickly but in a calm and reassuring manner.

- (d) The person assuming responsibility should immediately summon medical help (be explicit in reporting suspected types of injury or illness, location of victim, and type of assistance required).
- (e) Send people to meet the emergency medical services (EMS) personnel at highway intersections, entrance roadways or as needed to help direct them to scene. The injured person should not be moved except where necessary to prevent further injury.
- (f) The names of persons on the jobsite who are trained in CPR and first aid should be posted by the telephone or other communications method when possible, or posted in a prominent place.
- (g) The number to call for medical emergencies (911) shall also be posted by your telephone.
- (h) All first aid, chemical exposures and medical emergencies shall be reported to the Site Supervisor so that immediate response can be made and proper incident reporting procedures followed.

6. **GENERAL FIRST AID FOR MINOR INJURIES**

- (a) For purposes of this policy, general first aid is defined as any one-time treatment and any follow up visit for the purpose of observation, treatment of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care.
- (b) Minor injuries should be initially treated with self-administered first aid unless assistance of another person is required. This limits the exposure of other persons to potential pathogens in the blood, body fluids and tissues of the injured person.
- (c) Minor injuries requiring general first aid should always be reported to a supervisor and recorded on the *First Aid Report* form maintained at each work location at the first aid station. This is important because a minor injury may indicate a hazardous situation that should be corrected to prevent a serious future injury. It is also important to document a minor injury as having been "work related" if the injury later leads to serious complications, such as from an infected cut.

7. **PERSONAL PROTECTION DURING FIRST AID**

- (a) OSHA requires adherence to "Universal Precautions" when employees respond to emergencies which provide potential exposure to blood and other potentially infectious materials. "Universal Precautions" stresses that all patients should be assumed to be infectious for HIV and other bloodborne pathogens. *NOTE: See NSE's written safety program on Bloodborne Pathogens.*
- (b) Persons responding to a medical emergency should be protected from exposure to blood and other potentially infectious materials. Protection can be achieved through adherence

to work practices designed to minimize or eliminate exposure and through the use of personal protective equipment (i.e., gloves, masks, and protective clothing), which provide a barrier between the worker and the exposure source.

- (c) For most situations in which first aid is given, the following guidelines should be adequate:
 - (1) For bleeding control with minimal bleeding and for handling and cleaning instruments with microbial contamination, disposable gloves alone should be sufficient.
 - (2) For bleeding control with spurting blood, disposable gloves, a gown, a mask, and protective eye wear are recommended.
 - (3) For measuring temperature or measuring blood pressure, no protection is required.
- (d) After emergency care has been administered, hands and other skin surfaces should be washed immediately and thoroughly with warm water and soap if contaminated with blood, other body fluids to which universal precautions apply, or potentially contaminated articles. Hands should always be washed after gloves are removed, even if the gloves appear to be intact.

8. **REQUIREMENT TO REPORT WORK-RELATED INJURIES & ILLNESSES**

ALL WORK-RELATED INJURIES AND ILLNESSES SHALL BE REPORTED AND TREATED AS SOON AS POSSIBLE AFTER OCCURRENCE!

If an employee of NSE becomes injured or ill due to a work-related injury or illness and is in need of immediate medical assistance, this shall be reported to the Site Supervisor.

Failure to report minor injuries or to receive medical treatment may result in serious infections or complications to the health of the employee.

A *First Aid Station* is located at each work location and jobsite. Each *First Aid Station* shall be stocked with basic supplies specified in the inventory on the next page. Each First Aid Station will also contain *First Aid Report* forms.

When first aid is rendered, the supervisor will note treatment on the *First Aid Report* form. In the event the employee **REFUSES** first aid and/or examination by a doctor, this will be noted in the First Aid Report.

IMPORTANT: *If an employee declines first aid and/or medical treatment for a reported on-the-job injury after the Site Supervisor recommends it, the employee will **NOT** be allowed to continue work. Site Supervisors will discuss each such situation with NSE Safety Director or the Personnel Dept. **BEFORE** allowing the employee to return to duty.*

The Site Supervisor or someone designated by the Site Supervisor will be responsible for checking and maintaining the First Aid Station(s) at the work location. This person will take a regular inventory of supplies and make sure that the station or kit remains adequately stocked. The following first aid supplies checklist shall be used as a guide to ensure proper stocking of the station.

First Aid Supplies Checklist

The First Aid Station or First Aid Kit should contain:

<u>Item</u>	<u>Quantity</u>	<u>Needed</u>
Protective Rubber Gloves (Surgical Type)	2 pair	_____
Protective CPR Mask w/One-Way Valve	1 each	_____
Antiseptic Soap	1 each	_____
Absorbent gauze, 24" x 72"	1 pkg.	_____
Spool of absorbent gauze	1 spool	_____
Large adhesive bandages, 1"	1 pkg.	_____
Small adhesive bandages, 1/2"	1 pkg.	_____
Bandage compresses, 4", 1 per pkg.	1 pkg.	_____
Eye dressing	1 pkg.	_____
Bandage scissors	1 pair	_____
Tweezers	1 pair	_____
Triangular bandages, 1 per pkg.	3 pkg.	_____
Antiseptic pads, 3 per pkg.	2 pkg.	_____
Medical adhesive tape	1 roll	_____
Self-activating cool packs	2 each	_____
Burn ointment	4 pkg.	_____
Sterile eye wash, in bottle	1 each	_____
Heavy-duty sealable plastic bags	3 each	_____
Disposable splints	1 set	_____
Approved bio-hazard bags, red in color	4 each	_____
American Red Cross Pocket First Aid Guide		_____
First Aid Kit Inventory Checklist forms		_____
First Aid Report forms		_____

Date of order: _____ By: _____

For location: _____

9. EMERGENCY PROCEDURE FOR A SEVERED BODY PART

- (a) Call 9-1-1 for Emergency Medical Service immediately.
- (b) Transport the Patient and the severed part to the health care facility as quickly as possible.
- (c) Keep the Patient from eating and drinking in case he is later placed under anesthesia.
- (d) Do not allow the Patient to drink alcohol to "deaden" the pain.
- (e) DRESSING THE REMAINING PART OF THE LIMB. Wrap the end of the limb in a compressive dressing so bleeding is stopped. Do not wrap it so tightly that blood flow is cut off to healthy tissue
- (f) CARING FOR THE SEVERED PART. Wrap the severed part in a terrycloth towel, paper towel or piece of gauze.
- (g) PLACE THE SEVERED PART in a clean plastic bag or plastic container and seal it so that it is waterproof. Store plastic bag on ice.
- (h) WHEN A LIMB OR DIGIT IS PARTIALLY SEVERED. Wrap the injury with a compressive dressing tightly enough to stop blood flow.
- (i) SPLINT THE INJURED AREA by wrapping it securely to a piece of rigid material. Splints should only be used if you need to move a patient.

9. HEAT-RELATED ILLNESSES

- (a) Heat is a serious hazard outdoors in hot weather and indoors when the work exposes personnel to unusually hot temperatures and high humidity. A person's body builds up heat when at work, and sweats to get rid of extra heat.
- (b) But there are times when this cannot happen as it should – for example outdoors in the summer, on a humid day and without shade in an area where heat radiates from the surroundings. This may be a time when the body simply cannot cool off fast enough.
- (c) Too much heat can make a person tired, hurt job performance, and increase the chance of injury. Overheating can cause skin rash on the minor side, and progress into a range of conditions that can be life-threatening. Effects of physical overheating include:
 - (1) **Dehydration.** When the body loses water, a person cannot cool off fast enough, but will feel thirsty and weak.
 - (2) **Cramps.** The heat can cause muscle cramps, even after a person leaves work.
 - (3) **Heat exhaustion.** The victim feels tired, nauseous, headachy, and giddy (dizzy and silly). The skin is damp and looks ruddy or flushed. Fainting may occur.

- (4) **Heat stroke.** This is a life-threatening condition. The victim may have hot, dry skin and a high temperature. The skin dryness is because the body's ability to sweat is compromised or has shut down. Victims may feel confused, suffer convulsions or lose consciousness. Heat stroke can kill quickly and emergency medical assistance is urgently needed.
- (d) A person's risk of developing heat stress depends on several factors. These include physical condition, the weather (temperature **AND** humidity), clothing worn, quickness of movement and how much physical demand is being placed on the body (lifting, heavy work), if there is air circulation over the body, whether the person is in direct sunlight, and whether they are taking medication. Evaluation of workplace conditions using the Wet-Bulb Globe Temperature Index is one precise way to estimate the risk of heat stress.

TYPES OF HEAT SICKNESS (in a progressing order of seriousness)

- (1) **Heat Rash** is recognized by tiny, red, blister like eruptions on the skin and by a prickly, itchy, burning sensation. *First Aid: Bathe skin to prevent infection and put on dry clothes.*
- (2) **Sunburn** is caused by the exposure of unprotected skin to ultraviolet light. Symptoms of first degree sunburn are red, painful skin. Second degree sunburn causes blistering and/or peeling. *First Aid: Skin lotions, topical anesthetics and staying in a shaded area.*
- (3) **Heat Cramps** bring painful muscle spasms. *First Aid: Water and/or electrolyte replacement beverage. Get medical assistance.*
- (4) **Heat Exhaustion** results from loss of too much water or salt from the body. It causes cool, moist skin, obvious sweating and rapid pulse (more than 150 beats per minute). It may or may not cause fever. *First Aid: Water and/or electrolyte replacement beverage.*
- (5) **Heat Stroke** (thermoregulatory failure) is characterized by hot, dry skin, a flushed face, body temperature of 105 degrees F (40.6" C) or higher, rapid pulse and brain disorders such as headaches, confusion, delirium or unconsciousness. Usually, there is an absence of sweating because the body's "cooling system" has shut down. There may also be difficulty breathing, constricted pupils, high blood pressure, strange behavior, weakness, nausea or vomiting. *First Aid: This is a potentially **LIFE-THREATENING** condition. The victim must be removed from the heat source and the body temperature lowered as quickly as possible. Immerse in water (garden hose, shower, bath tub) or cover and massage the body with wet cool soaked towels or sheets. **DO NOT** give liquids to an unconscious person. Call for emergency medical assistance immediately.*

10. PROTECTIVE MEASURE TO AVOID HEAT STRESS

(a) *Here is advice that employees can be given toward preventing heat-related illness:*

- (1) Drink a lot of cool water all day— before you feel thirsty. Every 15 minutes, you may need a cup of water (5 to 7 ounces).
- (2) Keep taking rest breaks. Rest in a cool, shady spot. Use fans.
- (3) Wear light-colored clothing, made of cotton.
- (4) Do the heaviest work in the coolest time of the day.
- (5) Work in the shade.
- (6) For heavy work in hot areas, take turns with other workers, so some can rest.
- (7) If you travel to a warm area for a new job, you need time for your body to get used to the heat. Be extra careful the first two weeks on the job.
- (8) If you work in protective clothing, you need more rest breaks. You may also need to check your temperature and heart rate.

OSHA does not have a special rule for heat. But because heat stress is known as a serious hazard, workers are protected under the General Duty Clause of the Occupational Safety and Health Act. The clause says employers must provide "employment free from recognized hazards causing or likely to cause physical harm."

11. ADMINISTRATIVE AND WORK PRACTICE CONTROLS

Heat stress often can be reduced by rescheduling work. Sometimes, strenuous tasks can be postponed until a cooler time of day or a cooler season. Heavy jobs will be spread out over longer periods of time, allowing employees to pace themselves appropriately and to take work breaks as needed. Employees will be trained in the causes, symptoms, treatment and prevention of heat stress.

JOBSITE EMERGENCY NUMBERS

CALLING FROM	
FIRE	
POLICE	
AMBULANCE	
DOCTOR	
HOSPITAL	
NSE SAFETY DIRECTOR	
HELICOPTER AMBULANCE	

Forklift and Motorized Industrial Trucks

Policy:

All NSE employees required to operate a powered industrial truck and/or forklift must be trained to operate the equipment. Motorized industrial trucks and forklifts are a vital and necessary tool that enable the Company to conduct its business efficiently and safely.

Powered industrial trucks are defined as forklifts, platform lift trucks, power sweepers, motorized pallet jacks and all other motorized vehicles used on the Company's premises. The Company will insure that all industrial trucks are inspected daily for safety and mechanical operability. Any industrial truck found to be defective or unsafe will not be used until the defect or unsafe condition is repaired/remedied.

Employee Certification:

Employees must meet the following requirements before they are "certified" to operate a powered industrial truck:

- 18 Years of age
- Is physically qualified to operate the industrial truck and has no movement limitations concerning their arms, legs, foot, head, waist, back, hands or fingers.
- Has an established medical history that would interfere with their ability to operate the industrial truck to include:
 - a) Epilepsy
 - b) Mental, nervous, or other functional or psychiatric disorder
 - c) Arthritis, neuromuscular, or vascular disease
- Has the visual acuity and binocular vision of at least 20/40 (with or without corrective lenses), and the field of vision of at least 70 degrees in each eye.
- Has passed a pre-employment drug test.
- Does not use drugs that fall into the following categories: opiate, hallucinogenic, depressant, or stimulants.
- Has a valid drivers license
- Complete the "Industrial Truck" written Certification Examination of 70% or better
- Perform the required "On-the-Job Training" in operating an industrial truck.

The Supervisor will provide on-the-job training about how to physically operate the powered industrial truck and additional supervised training as necessary.

The Supervisor will discuss with and instruct the employee so that the employee can gain an understanding of the following key elements:

- Basic operation of the industrial truck to include its major components, principals of loading, load capacity, operating "nuances", etc.
- Maintenance and inspection of the industrial truck

- Starting and operating the truck- parking, turning, load traveling, stacking, backing up, etc.
- Refueling procedures
- Personal Protective Equipment- seat belt, safety shoes, hard hat, gloves, etc.

On-the-Job Coach

Provides on-the-job (hands on training) as needed to physically operate the powered industrial truck. This training will be divided into specific areas listed below:

- Pre-Operation and Inspection of Powered Industrial Trucks
- Proper start-up and mastery of controls
- Maneuvering Skills
- Safety procedures
- Re-fueling or re-charging
- Actually operating the truck in working situations

Once the employee completes the minimum training time, shown consistent safe operating skills, and has demonstrated the ability to handle the equipment, the On-the-Job coach certifies the employee according to the Truck Operator Performance Test.

DAILY CHECKLISTS FOR POWERED INDUSTRIAL TRUCKS

DAILY INSPECTION CHECKLIST

Electric Forklift Truck

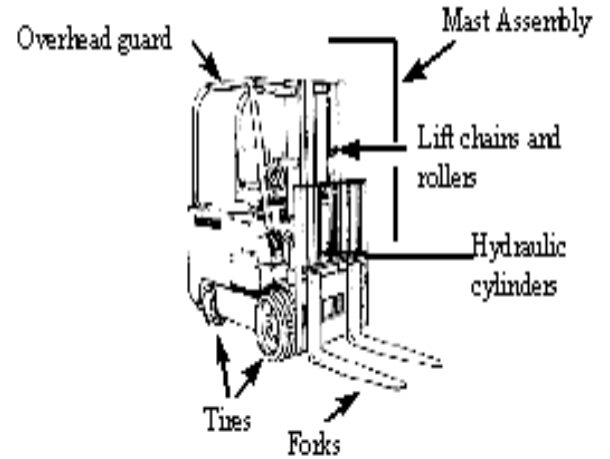
KEY OFF Procedures

- .. The vehicle inspection
 - .. Overhead guard
 - .. Hydraulic cylinders
 - .. Mast assembly
 - .. Lift chains and rollers
 - .. Forks
 - .. Tires
- .. Examine the battery
- .. Check the hydraulic fluid level

KEY ON Procedures

- .. Check the gauges
 - .. Hour meter
 - .. Battery discharge indicator
- .. Test the standard equipment
 - .. Steering
 - .. Brakes
 - .. Front, tail, and brake lights
 - .. Horn
- .. Safety seat (if equipped)
- .. Check the operation of load-handling attachments

Electric Forklift Truck



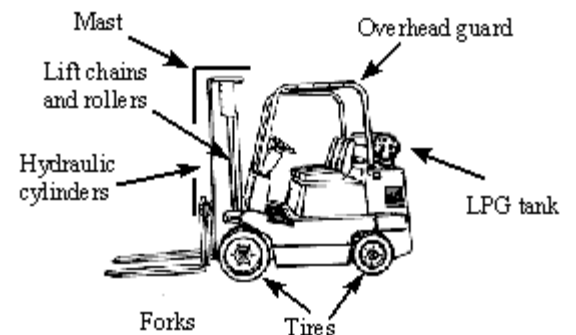
DAILY INSPECTION CHECKLIST

Propane Forklift Truck

KEY OFF Procedures

- .. The vehicle inspection
 - .. Overhead guard
 - .. Hydraulic cylinders
 - .. Mast assembly
 - .. Lift chains and rollers
 - .. Forks
 - .. Tires
 - .. LPG tank and locator pin
 - .. LPG tank hose

Propane Forklift



.. Gas gauge
DAILY INSPECTION CHECKLIST
Propane Forklift Truck (continued)

KEY OFF Procedures (continued)

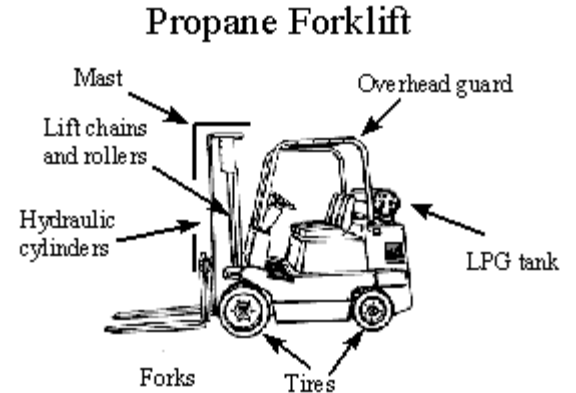
- .. Check the engine oil level
- .. Examine the battery
- .. Check the hydraulic fluid level
- .. Check the engine coolant level

KEY ON Procedures

- .. Test the front, tail, and brake lights

ENGINE RUNNING Procedures

- .. Check the gauges
 - .. Oil pressure indicator lamp
 - .. Ammeter indicator lamp
 - .. Hour meter
 - .. Water temperature gauge
- .. Test the standard equipment
 - .. Steering
 - .. Brakes
 - .. Horn
- .. Safety seat (if equipped)
 - .. Check the operation of the load-handling attachments
- .. Check the transmission fluid level

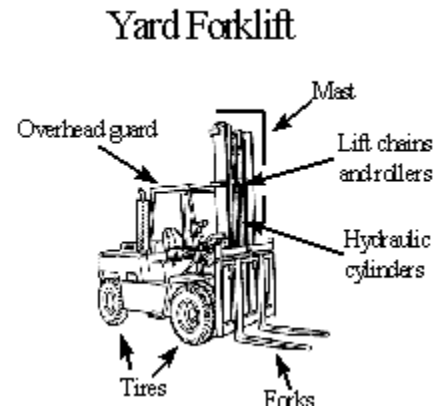


DAILY INSPECTION CHECKLIST
Yard Forklift Truck

KEY OFF Procedures

The vehicle inspection

- .. Overhead guard
- .. Hydraulic cylinders
- .. Mast assembly
- .. Lift chains and rollers
- .. Forks
- .. Tires
- .. LPG tank and locator pin
- .. LPG tank hose
- .. Gas gauge



KEY OFF Procedures (continued)

- .. Check the engine oil level
- .. Examine the battery
- .. Inspect the hydraulic fluid level
- .. Check the engine coolant level

KEY ON Procedures

Test the standard equipment

- .. Front, tail, and brake lights
- .. Fuel gauge (if diesel)
- .. Windshield wiper
- .. Heater

ENGINE RUNNING Procedures

Check the gauges

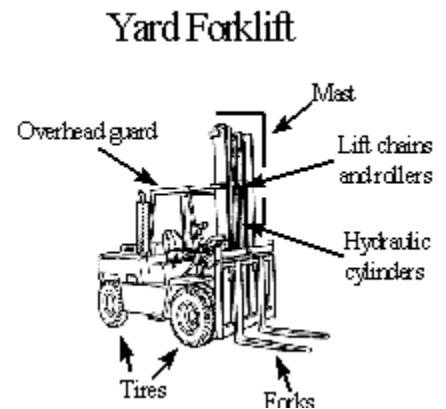
- .. Oil pressure indicator lamp
- .. Ammeter indicator lamp
- .. Ammeter
- .. Hour Meter
- .. Water Temperature Gauge

Test the standard equipment

- .. Steering
- .. Brakes
- .. Horn
- .. Safety seat (if equipped)

Check the operation of load-handling attachments

Check the transmission fluid level



GENERIC CHECKLIST FOR POWERED INDUSTRIAL TRUCKS

Overhead Guard - Are there broken welds, missing bolts, or damaged areas?

Hydraulic Cylinders - Is there leakage or damage on the lift, tilt, and attachment functions of the cylinders?

Mast Assembly - Are there broken welds, cracked or bent areas, and worn or missing stops?

Lift Chains and rollers - Is there wear or damage or kinks, signs of rust, or any sign that lubrication is required?

Is there squeaking?

Forks - Are they cracked or bent, worn, or mismatched?

Is there excessive oil or water on the forks?

Tires - What do the tires look like?

Are there large cuts that go around the circumference of the tire?

Are there large pieces of rubber missing or separated from the rim?

Are there missing lugs?

Is there bond separation that may cause slippage?

Battery Check - Are the cell caps and terminal covers in place?

Are the cables missing insulation?

Hydraulic Fluid - Check level? **Gauges**

- Are they all properly working?

Steering - Is there excessive free play?

If power steering, is the pump working?

Brakes - If pedal goes all the way to the floor when you apply the service brake, that is the first indicator that the brakes are bad. Brakes should work in reverse, also.

Does the parking brake work? The truck should not be capable of movement when the parking brake is engaged.

Lights - If equipped with lights, are they working properly?

Horn - Does the horn work?

Safety seat - if the truck is equipped with a safety seat is it working?

Load Handling Attachments - Is there hesitation when hoisting or lowering the forks, when using the forward or backward tilt, or the lateral travel on the side shift?

Is there excessive oil on the cylinders?

Propane Tank - Is the tank guard bracket properly positioned and locked down?

Propane Hose - Is it damaged? It should not be frayed, pinched, kinked, or bound in any way.
Is the connector threaded on squarely and tightly?

Propane Odor - If you detect the presence of propane gas odor, turn off the tank valve and report the problem.

Engine Oil - Check levels.

Engine Coolant - Visually check the level. Note: Never remove the radiator cap to check the coolant level when the engine is running or while the engine is hot. Stand to the side and turn your face away. Always use a glove or rag to protect your hand.

Transmission Fluid - Check levels?

Windshield Wipers - Do they work properly?

Seat Belts - Do they work?

Safety Door - (found on stand up rider models) Is it in place?

Safety Switch - (found on stand up riding tow tractors) Is it working?

Hand guards - (found on stand up riding tow tractors, walking pallet trucks, walking transtackers) Are they in place?

Tow Hook - Does it engage and release smoothly?

Does the safety catch work properly?

Control Lever - Does the lever operate properly?

Safety Interlock - (found on order pickers) If the gate is open, does the vehicle run?

Gripper Jaws - (found on order pickers) Do the jaws open and close quickly and smoothly?

Work Platform - (found on order pickers) Does the platform raise and lower smoothly

NEXTSUN ENERGY, LLC

Ground Fault Circuit Interrupters (GFCI) & Assured Grounding Process

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General Requirements	5
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Training & Testing	7
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Process Test	1

NEXTSUN ENERGY, LLC

Ground Fault Circuit Interrupters (GFCI) & Assured Grounding Process

1. PURPOSE

To establish methods, guidelines and responsibilities to protect NextSun Energy, LLC employees from electrical exposure while on construction sites.

2. SCOPE

This assured equipment grounding conductor process covers all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by:

- m. NextSun Energy, LLC (NSE)
- n. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- o. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. REFERENCE

29 CFR 1926.404

4. INTRODUCTION

All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kV, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

5. GENERAL REQUIREMENTS

- (a) Employees who are exposed to electrical hazards at a work location shall use either ground fault circuit interrupters or an assured equipment grounding conductor process to

protect them from these hazards. These requirements are in addition to any other specific requirements for equipment grounding conductors.

- (b) NSE has established and implemented an assured grounding conductor process at all work locations covering all cord sets, receptacles that are not part of the building or structure and equipment connected by cord and plug that are available for use, or are in use by employees.
- (c) A written description of the process including the specific procedures adopted by NSE shall be available at each work location for inspection and copying by the Assistant Secretary and any affected employee.
- (d) NSE shall designate one or more competent persons to implement the process at each work location. "*Competent person*" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. At most work locations the competent person will be the Site Supervisor.
- (e) Before each day's use each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.
- (f) Damaged items shall be tagged "DO NOT USE" and removed from service until repaired and tested.
- (g) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:
 - (1) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.
 - (2) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.
- (h) NSE shall not make available or permit the use by employees, of any equipment which has not met the requirements of this process.
- (i) Tests performed as required in this process shall be recorded. This test record shall identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the work location for inspection by the Assistant Secretary and any affected

employee. A copy of this process is kept on each work location with the Site Supervisor.

- (j) The Site Supervisor is responsible for implementing and monitoring the GFCI and assured grounding process.
- (k) The GFCI is not a replacement for visually checking all cords, wires, and other electrical devices for defects.
- (l) All 120 volt, single phase, 15 and 20 ampere receptacles shall be of the grounding type and their contacts shall be grounded by connection to the equipment grounding conductor of the circuit supplying the receptacles in accordance with applicable requirements of the National Electrical Code.
- (m) All 120 volt cord sets (extension cords) shall have an equipment grounding conductor which shall be connected to the grounding contacts of the connectors on each end of the cord. Extension cord sets used with portable electric tools and appliances shall be of the three-wire type and shall be designed for heavy or extra heavy-duty usage. Flexible cords used with temporary and portable lights shall be designed for heavy or extra heavy-duty usage.
- (n) The exposed non-current-carrying metal parts of 120 volt cord and plug connected tools or equipment that are likely to become energized shall be grounded in accordance with the applicable requirements of the National Electrical Code.
- (o) Employees shall visually inspect receptacles, flexible cord sets (extension cords), electrical equipment and electrical tools before each day's use for external defects such as:
 - ¾ Deformed or missing pins;
 - ¾ Insulation damage;
 - ¾ Indication of possible internal damage.

Where there is evidence of damage the item shall be taken out of service until tests or any required repairs have been made.

6. **TESTING**

- a. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure, 120 volt flexible cord sets and 120 volt cord and plug connected equipment which are in use by employees, shall be tested.
- b. A qualified person will be designated by the Site Supervisor to be responsible for testing, tagging and documentation of testing of all equipment-grounding conductors.

- c. All equipment-grounding conductors will be tested for continuity and they shall be electrically continuous. A continuity inspection device will be used or a voltmeter that is specifically designed to test for continuity.
- d. Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment-grounding conductor. The equipment-grounding conductor shall be connected to the proper terminal.
- e. All required test shall be performed:
 - $\frac{3}{4}$ Before its first use;
 - $\frac{3}{4}$ Before the equipment is returned to service following any repairs;
 - $\frac{3}{4}$ Before the equipment is used after any incident that can be reasonably suspected to have caused damage (for example, when a cord is run over).
 - $\frac{3}{4}$ At intervals not exceeding 3 months, except that cord sets and receptacles, which are fixed and not exposed to damage, shall be tested at intervals not exceeding 6 months.
- f. Test verification shall be by means of a color coded marking tape on the receptacle, cord set or equipment to identify that it has passed the test and to indicate the quarter as illustrated in the following table:

Quarter	Month	Color Code	Number
1 st	January	White	1
1 st	February	White	2
1 st	March	White	3
2 nd	April	Green	1
2 nd	May	Green	2
2 nd	June	Green	3
3 rd	July	Red	1
3 rd	August	Red	2
3 rd	September	Red	3
4 th	October	Orange	1
4 th	November	Orange	2
4 th	December	Orange	3
	Repair Color	Brown	

7. **TRAINING & TESTING**

- a. Training about the process shall be provided to all affected employees prior to work assignments involving exposure to electrical hazards. Training will primarily involve a thorough review of what the standard covers (29 CFR 1926.404), company policy and work experiences relating to implementation of this process.
- b. Personnel so trained shall be tested as a way to help confirm and document their understanding of information presented. A score of between 80% and 100% will require a review of missed questions, if any, and the score corrected to 100%. A score of below 80% will require complete retraining and testing.
- c. The test format is included as Appendix 1 in this process.

NEXTSUN ENERGY, LLC

Hydrogen Sulfide (H₂S) Safety Process

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NEXTSUN ENERGY, LLC

Hydrogen Sulfide (H₂S) Safety Process

1. **PURPOSE**

- a. NextSun Energy, LLC (NSE) is a contractor that may perform services for clients/customers in workplaces that may present exposures to hydrogen sulfide (H₂S).

Consequently, NSE has designed and adopted a *Hydrogen Sulfide (H₂S) Safety Process* to prevent injuries and death due to exposure to hydrogen sulfide gas at well sites, pipeline, facility and job locations. Operations that may expose employees to H₂S are those that have proximity to H₂S release and accumulation situations. These include painting in plant facilities and on pipelines, pipeline maintenance and repair and any work that is performed near wells, tanks and production facilities.

- b. This process also provides for training job site supervisors to ensure they have the required knowledge and understanding of H₂S safety, hazard recognition and response to an H₂S emergency.

2. **SCOPE**

This H₂S safety process is required for well, pipeline and other jobsites where there is a potential to H₂S exposure for:

- p. NextSun Energy, LLC (NSE)
- q. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- r. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **PHYSICAL CHARACTERISTICS**

- a. Hydrogen sulfide (H₂S) refers to either the gaseous or liquid form of the compound. Under atmospheric conditions, it is a highly flammable and colorless gas.
- b. Typically called "sour gas", hydrogen sulfide is soluble in water, crude oil or petroleum fractions, and is extremely corrosive.
- c. The gas can cause severe stress cracking of steel and other metals
- d. Hydrogen sulfide burns with a blue flame to form sulfur dioxide which is also a toxic gas.

- e. Hydrogen Sulfide has a density 1.2 times greater than that of air and tends to settle in low lying areas.
- f. The gas can be dispersed by wind movement or air currents. Additional characteristics are provided in Appendix 1 in this process.
- g. It is important to understand that the concentration of hydrogen sulfide can be measured or expressed in two ways:
 - $\frac{3}{4}$ parts per million (ppm) of H₂S in liquid, by weight ratio,
 - $\frac{3}{4}$ ppm of H₂S in the air, by volume ratio.
- h. While both methods of measurement are utilized, there is a significant difference between a hydrogen sulfide concentration in air and that in liquid. The actual concentration measured in air (by volume ratio) is usually much higher, and can be 10 to 100 times higher than the same value measured in liquid by weight ratio. For example, crude oil being discharged into a storage tank may contain only 70 ppm hydrogen sulfide in the liquid by weight. However, the concentration of hydrogen sulfide in the tank vapor space above the crude oil could exceed 7000 ppm hydrogen sulfide by volume. Unless otherwise specified, all following discussions refer to hydrogen sulfide concentrations based on ppm in air, by volume ratio.

4. **EXPOSURE STANDARDS**

- a. The exposure standards provided are intended primarily for domestic operations. Where foreign operations are concerned, practices must be in accordance with the respective foreign government's regulations.
- b. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends an 8-hour Threshold Limit Value (TLV) of 10 ppm for hydrogen sulfide. The ACGIH Threshold Limit Value (TLV) is the time weighted average concentration of H₂S for a normal 8 hour workday, 40-hour workweek, in which it is believed that nearly all workers may be exposed day after day, without adverse effect. The ACGIH short term exposure limit (STEL) is 15 ppm. The STEL is the concentration in which workers may be exposed for no more than four 15 minute periods throughout the workday, without suffering adverse effects.
- c. The United States Occupational Safety and Health Administration (OSHA) does not address an 8 hour time weighted average exposure limit. However, OSHA does specify an Acceptable Ceiling Concentration of 20 ppm. An employee's exposure to H₂S shall not exceed, at any time during the 8-hour workday, the Acceptable Ceiling Concentration (20 ppm), except for a single 10 minute exposure not to exceed 50 ppm. This 50 ppm level is noted by OSHA as the Maximum Peak above the acceptable Ceiling.

- d. Considering the OSHA exposure standards in a common manner, workers may be exposed to a 50 ppm H₂S concentration for a single 10 minute period of a workday. Otherwise, short term exposures shall not exceed 20 ppm.
- e. In addition to federal regulations and guidelines such as the Threshold Limit Values, some state governments such as California have enacted occupational health and safety legislation. In many cases, state regulations are a merging of the OSHA and ACGIH exposure limits. For example, Cal OSHA notes an 8 hour hydrogen sulfide exposure limit of 10 ppm. An excursion limit of 20 ppm may be experienced over one 20 minute period per 8 hours, and a ceiling limit of 50 ppm is not to be exceeded at any time. Operations located in states having their own occupational health and safety regulations should reference the respective exposure limits with regard to exposure control and compliance.
- f. The exposure limits for hydrogen sulfide are primarily based upon the irritant effects of the gas and resulting worker discomfort. The more significant concerns regarding the potential disabling or lethal capabilities of the gas at concentrations greater than 100 ppm are not primarily considered.

5. **HEALTH EFFECTS FROM EXPOSURE**

- a. The effects associated with hydrogen sulfide exposure are primarily determined by the concentration of the gas in the individual's breathing zone, the length of the exposure period(s) and individual susceptibility to the contaminant.
- b. Exposure effects at various hydrogen sulfide concentrations are provided in summary as Table I.
- c. The health effects associated with hydrogen sulfide exposure are most often the result of sudden, excessive exposures experienced over a short time period. For example, a short term exposure to hydrogen sulfide at a concentration of 600 ppm can result in death within minutes.
- d. A most important characteristic of hydrogen sulfide gas is its ability to cause olfactory fatigue or a failure in the sense of smell. At concentrations approaching 100 ppm, exposure to hydrogen sulfide causes a loss of the sense of smell. This effect can result in an individual developing a false sense of security relative to the exposure conditions.

HIGH CONCENTRATIONS OF HYDROGEN SULFIDE, ESPECIALLY THOSE CAPABLE OF CAUSING PHYSIOLOGICAL DAMAGE, CANNOT BE DETECTED BY THE SENSE OF SMELL.

Please see table on following page.

Table I -- Potential Health Effects of Hydrogen Sulfide at Various Concentrations

<u>H₂S Concentration</u> (ppm)*	<u>Potential Effect</u>
10 to 20	eye irritation, especially in hyper-susceptible workers
20 to 100	inflammation, corneal blistering and the capacity of the eye, loss of the sense of smell, headache, cough, nausea
100 to 300	respiratory difficulty, pulmonary edema, respiratory depression and irritation (30 min - 8 hrs)
300 to 600	central and peripheral nervous system effects, e.g., tremors, weakness, numbness of extremities, unconsciousness and convulsions (several minutes - hrs)
600 to 1000	rapid breaths, unconsciousness resulting in death if emergency aid is not promptly administered
1000 and greater	cessation of breathing (instantaneous) and death

Note: Effects described at a specific concentration usually occur with increasing severity at higher concentrations.

* Parts per million parts of air in breathing zone.

6. WORK PRACTICES

- a. The incorporation of the specific work practices discussed below into routine operation and maintenance activities can help prevent overexposure to hydrogen sulfide. These work practices have proven effective in controlling hydrogen sulfide exposure in various NSE operations.

$\frac{3}{4}$ Ventilation

- When the potential for hydrogen sulfide exposure occurs during routine operation and maintenance activities, ventilation of the worker's breathing zone is extremely important. Hydrogen sulfide gas is 1.2 times heavier than air and does not readily dissipate. The gas accumulates in low lying and confined spaces and may remain for an extended time. Adequate ventilation, whether provided by natural winds, powered air or local exhaust, can prevent hazardous concentrations of hydrogen sulfide from accumulating.
- Outdoor tasks involving potential exposure to hydrogen sulfide should not be conducted on calm days, when it is not practical to do so. Wind direction should be verified by a wind sock, streamer, or vane, prior to initiating work. If possible, workers should always remain upwind from the source of the gas during tasks. Wind conditions cannot be relied upon as a single means of controlling exposure.

- Inside work, where hydrogen sulfide exposure may occur, should be conducted under a properly functioning laboratory hood or with local exhaust ventilation placed at the source of emission. Laboratory hoods should provide a minimum average face velocity of 125 linear feet per minute (fpm). Ventilation requirements for confined spaces are discussed separately.

¾ Monitoring

- When routine and maintenance tasks involve potential exposure to hydrogen sulfide above 20 ppm, the use of continuous reading personal monitors with audible and/or visual alarms is recommended. Obviously, when a group of employees is working close together, it is not necessary that each employee wear a monitor. Area or personal monitors shall be of a type that sounds an alarm when a level of 20 PPM is detected. Upon the sounding of an area or personal H₂S monitor evacuation of the area shall begin immediately to a safe area upwind from the location. The evacuated area shall not be re-entered except by trained and authorized personnel utilizing appropriate respiratory protection; or until the “all clear” is sounded by personnel in charge of the work site and it is safe to re-enter the area.
- Representative employees should be selected to wear personal monitors when such group tasks are to be performed. Portable monitors can be substituted for the personal type as long as it adequately samples the work area used by all employees with a potential for exposure.
- Monitors should be utilized for the complete duration of work activity. It is recommended that monitors be set to alarm at 20 ppm. If the alarm sounds, indicating a concentration at/or above this level, workers should immediately leave the area.
- Workers should withdraw upwind to a position that is considered to be a safe distance from the source of the gas. The alarm will continue to sound until the detector-sensor is cleared of hydrogen sulfide.
- Allowing workers to reenter, and work in the area should be permitted only if they are wearing a full face pressure demand airline respirator with egress bottle or self contained breathing apparatus (SCBA).
- This procedure should be followed until it has been established that the area is safe from hydrogen sulfide (less than 20 ppm). Depending on the type of monitor and the concentration of the gas, this can take several minutes, even though the monitor is removed to a hydrogen sulfide free atmosphere.
- Continuous fixed area monitors can be permanently installed in locations where the sudden release of hydrogen sulfide is possible. The monitor sensors should be placed in proximity to potential sources of a hydrogen sulfide release. Several sensors may be necessary at points of possible gas emission, and should be connected to a central monitor. The monitor's warning device, audible and visual,

should be located so that the alarm can be easily recognized throughout the facility. Employees should be instructed to follow established response procedures in the event an alarm is activated.

- Both personal and area monitors must be routinely calibrated and properly maintained. Procedures should be established to carry out these functions. The individual or group responsible for this activity should be identified and should keep a log book for recording calibration and maintenance.

7. **RESPIRATORY PROTECTION**

Supplied air (airline or SCBA) respiratory protection against hydrogen sulfide exposure is required in the following situations:

- (a) When routine or maintenance work tasks involve exposure to H₂S concentrations of 20 ppm or greater.
- (b) When a fixed monitor alarms, and re-entry to the work area is required to complete a job.
- (c) When confined spaces are to be entered without knowledge of H₂S levels present, or if initial measurements are to be taken of H₂S levels.
- (d) During rescue of employees suspected of H₂S overexposure.
- (e) For specific tasks identified with significant exposure potential and outlined in local process guidelines.
- (f) All respiratory equipment for hydrogen sulfide must be of the supplied air type, equipped with pressure demand regulators and operated in the pressure demand mode only. This is the only type of respiratory protection recommended for hydrogen sulfide application. Equipment should be approved by NIOSH/MSHA or other recognized national authority as required. If airline units are used, a five minute egress bottle should also be carried.
- (g) Gas masks or other air purifying respirators *MUST NEVER BE USED FOR HYDROGEN SULFIDE* due to the poor warning properties of the gas.
- (h) Use of respiratory protection should be accompanied by a written respiratory protection process.

8. **CONFINED SPACE**

- a. Work conducted in low lying areas and confined spaces where hydrogen sulfide may be present require specific precautions beyond those described above. These conditions may be encountered during excavation and line repair or tank (vessel) maintenance and inspection.
- b. Prior to beginning work, these tasks require that the excavated area or vessel be thoroughly tested with a direct reading hydrogen sulfide instrument, as well as tested for

sufficient oxygen and the absence of flammable atmospheres. These measurements should be included as an integral part of an entry procedure. Furthermore, where entry permits are required these measured levels should be noted on the permit.

- c. Combination hydrogen sulfide detectors which also measure combustible gas and oxygen are available. CARE SHOULD BE TAKEN TO DETERMINE THE HYDROGEN SULFIDE CONCENTRATION THROUGHOUT THE COMPLETE AREA. Particular attention should be given to measuring hydrogen sulfide in the bottom of tanks, vessels, or open pits, and on the top of floating roof tanks, where the gas is likely to concentrate. IF ENTRY IS REQUIRED ON THE TOP OF FLOATING ROOF TANKS TO PERFORM THIS INITIAL TEST, THEN RESPIRATORY PROTECTION, AS DESCRIBED PREVIOUSLY, SHOULD BE WORN BY THE TESTER.
- d. If hydrogen sulfide levels are determined to be above 20 ppm, entry into a confined space should require respiratory protection. Efforts should be made to ventilate the confined space prior to scheduled entry. When concentrations of hydrogen sulfide remain above 20 ppm, additional forced air venting is recommended before entry, when time permits.
- e. If entry is necessary under the above condition, respiratory protection should consist of a pressure demand airline respirator with an egress bottle or an SCBA. A standby person, also equipped with proper respiratory protection, should be outside the vessel and in constant audio or visual contact with the worker inside. This precaution is necessary to ensure that rapid rescue of the worker inside can be accomplished.

9. LOCATION CONTROLS AND WARNING SIGNS

a. Wind Indicators

- ³/₄ Wind direction should be determined prior to performing outdoor tasks where hydrogen sulfide may be encountered.
- ³/₄ Work tasks which can be performed upwind from a hydrogen sulfide source can greatly reduce the potential for gas in the worker's breathing zone.
- ³/₄ Wind socks, streamers, or vanes provide an indication of wind direction.
- ³/₄ These wind indicators should be placed at a location and height to enable free movement and should accurately indicate wind direction.
- ³/₄ The wind indicator should be easily visible from normal entrances to the work area and from all work locations.

b. Warning Signs

- ³/₄ Consistent with Hazard Communication requirements, warning signs for hydrogen sulfide should be posted to remind employees of the potential hazard at each specific location.

- ¾ Additionally, signs should indicate the need for monitors or respiratory protection in areas where such equipment is required.
- ¾ Where applicable, warning signs should be posted at producing well sites, tank batteries, refinery units, and chemical facilities, etc.
- ¾ In effect, signs should be posted on all units where the potential for a dangerous release of hydrogen sulfide exists.
- ¾ Signs should be large enough to be easily visible.
- ¾ Warning signs such as the following are recommended although variations in the wording may be used:
 - WARNING HAZARDOUS AREA
 - HYDROGEN SULFIDE
 - HEALTH HAZARD
 - POTENTIALLY FATAL OR HARMFUL IF INHALED

10. AUTOMATIC TANK GAUGES

- a. Automatic Tank Gauging instruments have been used successfully in some operations to control potential hydrogen sulfide exposures. These devices can be installed on crude, produced (RECOVERED) water, and chemical product storage tanks to reduce the need for conventional manual tank gauging and the subsequent potential for gauge exposure. They enable measurement of storage tank volume and require only occasional manual gauging to check for proper operation.
- b. When tanks equipped with automatic gauges require manual gauging and contain hazardous concentrations of hydrogen sulfide, the tank gauge should use pressure demand supplied air respiratory protection.
- c. Respiratory protection should be utilized until the hydrogen sulfide concentration is determined to be within acceptable levels as measured by appropriate monitoring equipment.

11. EMERGENCY PROCEDURES

Respiratory Protection

- a. The prompt performance of specific rescue and emergency first aid procedures can very often result in the full recovery of victims overcome by hydrogen sulfide. These victims should be immediately removed from the contaminated atmosphere by a rescuer wearing full face pressure demand supplied air respiratory protection, e.g., SCBA or supplied air with egress unit.

- b. RESCUE SHOULD NEVER BE ATTEMPTED WITHOUT APPROPRIATE RESPIRATORY PROTECTION! Many such attempts have resulted in the rescuer also becoming a victim.
- c. Respiratory protection equipment should be located on-site for rescue purposes and/or carried on NSE vehicles, depending on practicality and need. Full face, pressure demand self-contained breathing apparatus (SCBA) is most appropriate for rescue.
- d. Respiratory protection designed specifically for safe egress may be appropriate for some limited locations. Egress equipment differs significantly in design and application from standard SCBA and airline respiratory equipment. This equipment can be placed at visible and easily reached points or carried by employees in areas where the sudden release of hydrogen sulfide is possible.
- e. Egress equipment is primarily suited for areas where exit is restricted and either personal or area monitors are in use. Egress equipment should provide full-face protection and 5 to 15 minutes of air supply. The number of such devices should be determined according to the number of workers commonly in the area. EGRESS EQUIPMENT IS DESIGNED FOR ESCAPE ONLY AND IS NOT INTENDED FOR RESCUE OR ROUTINE RESPIRATORY PROTECTION PURPOSES!

12. EMERGENCY AID

- a. Once the victim is safely removed from the contaminated atmosphere, the rescuer should begin artificial respiration or administer oxygen if breathing has ceased. FRESH AIR SUPPLIED TO THE VICTIM'S LUNGS THROUGH ONE OF THESE METHODS IS THE MOST IMMEDIATE NEED. Back pressure artificial respiration may be applied initially to clear the victim's lungs of the toxic gas before mouth-to-mouth artificial respiration is administered. NOTE: Follow NSE's first aid procedures.
- b. Caution should be taken during the application of artificial respiration not to inhale air directly from the victim's lungs. This could also result in the rescuer being overcome. Depending on the length of exposure and concentration of hydrogen sulfide, heart failure may occur within 4 to 6 minutes should the exposure be major. If the victim's heart has stopped, cardiopulmonary resuscitation (CPR) must be started immediately. RECOVERY FROM OVEREXPOSURE TO HYDROGEN SULFIDE IS USUALLY COMPLETE IF THIS AID IS ADMINISTERED PROMPTLY.
- c. If the victim does not respond to emergency aid, emergency medical aid should be summoned to the scene, and the individual should be taken, as soon as possible, to a hospital for further treatment. REGARDLESS OF APPARENT CONDITION, OVEREXPOSURE VICTIMS SHOULD RECEIVE APPROPRIATE MEDICAL ATTENTION AS SOON AS POSSIBLE.
- d. Plans for obtaining emergency medical care and transportation of victims should be prearranged such as with contingency plans. Notification lists or contingency plans

should be prominently posted or available to individual employees. This list should include the names and phone numbers of local medical facilities, ambulance services, and NSE supervisory personnel to be contacted. Local medical facilities should be prepared to handle victims of hydrogen sulfide exposure. Therefore, they must be notified so they can make necessary arrangements to be able to handle such incidents.

13. CONTINGENCY PLANS

Another part of the contingency plans should be developed for evacuation of employees and local residents where the potential exists for a significant and hazardous hydrogen sulfide release. Employees should be familiar with these plans and with their specific responsibilities in the event that the plan is activated. The plans should be developed in accordance with local, state, and federal environmental and public safety agency requirements.

14. TRAINING

- a. All employees who may encounter H₂S as part of routine or maintenance work should receive thorough training on the hazards associated with hydrogen sulfide. Refresher training should be conducted annually.
- b. The training should include:
 - ¾ The hazards of hydrogen sulfide;
 - ¾ Proper work practices to reduce the potential for exposure;
 - ¾ The hydrogen sulfide exposure conditions in the employees' work areas;
 - ¾ The proper use and limitations of hydrogen sulfide monitors and respiratory protective equipment;
 - ¾ Rescue and emergency aid procedures in assisting hydrogen sulfide overexposure victims.
- c. Employees performing jobs that require respiratory protection should receive training specific to the use and limitations of the equipment. Also, employees designated to perform maintenance and inspection of respiratory protective equipment should receive adequate training in these aspects as well.
- d. New or transferred employees should receive instruction regarding hydrogen sulfide and respiratory protection prior to their full release to the new work location.

15. REQUIRED WRITTEN PROCESSES

- a. Standard Operating Procedures (SOPs) should be written by each job site supervisor if the potential for significant hydrogen sulfide exposure exists during routine tasks, maintenance activities, and confined space entry. These SOPs should be brief, and stated in such a manner that they can be easily understood.
- b. A written respiratory protection process is required by OSHA when respiratory protection is utilized. Such a process is also recommended for NSE operations outside OSHA jurisdiction. Written respiratory protection processes should include instruction on proper maintenance, inspection, use, and cleaning of respiratory protection equipment.
- c. The process should also indicate the individual responsible for these activities, and the time at which these various functions are to be carried out. Requirements for training and subsequent refresher training should also be specified.
- d. Routine work operations for NSE employees *DO NOT* include entering confined spaces to perform work. This includes confined spaces that may contain an accumulation of H₂S. In the event that a work assignment should require entering what is identified as a confined space, entry shall be performed in accordance with NSE's written Confined Space Entry process; and only by personnel who have been trained and authorized to perform this type of hazardous duty. All such work assignments shall be specifically authorized in advance by the Site Supervisor and NSE Safety Director.

16. MEDICAL SURVEILLANCE

- a. Employees subject to potential exposure to hydrogen sulfide can be included in a medical surveillance process.
- b. Pre-placement physical examinations should review work histories to determine the significance of any previous exposure to hydrogen sulfide.
- c. The employee ability to use pressure demand respiratory protection and /or aid in emergency rescue should be determined.
- d. The physical examination should place particular attention on symptoms related to the eyes, central nervous, cardiovascular and respiratory systems.

APPENDIX 1

Physical and Chemical Properties

Hydrogen Sulfide

<u>Molecular Formula</u>	<u>H₂S</u>
Density compared to air (air-1.0)	1.2 (gas @ 15NC, 1 atm.)
Auto ignition temperature	260NC (500NF)
Flammable range in air	4.3-45% (by volume in air)
Appearance of gas	Colorless
Solubility in Water (Fresh or Salt)	Highly soluble
Solubility in Oil	Highly soluble
Odor	"Rotten eggs"
Odor threshold	0.02 ppm*
Olfactory fatigue level	100 ppm* (may vary)

* parts of H₂S per million parts air.

NEXTSUN ENERGY, LLC
Hazard Communication Process

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NEXTSUN ENERGY, LLC

Hazard Communication Process

1. **PURPOSE**

The purpose of this process is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to NextSun Energy, LLC (NSE) and its employees.

2. **SCOPE**

This process applies to any chemical which is known to be present in any NSE job site in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency by:

- a. NextSun Energy, LLC (NSE)
- b. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- c. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **REFERENCE**

29 CFR 1910.1200

29 CFR 1926.59

4. **GENERAL REQUIREMENTS**

- a. The following written Hazard Communication Process is to be implemented for personnel of NSE Information about this process, any hazardous chemicals at their work location and training about the process shall be provided to employees prior to work assignment. This process shall be reviewed when new processes or work assignments require changes or updating, and at least annually to be changed or updated as required.
- b. NSE Safety Director will be responsible for ensuring the process is current and enforced. The Site Supervisor is responsible for ensuring that the process is effectively implemented at the supervisor's work location.

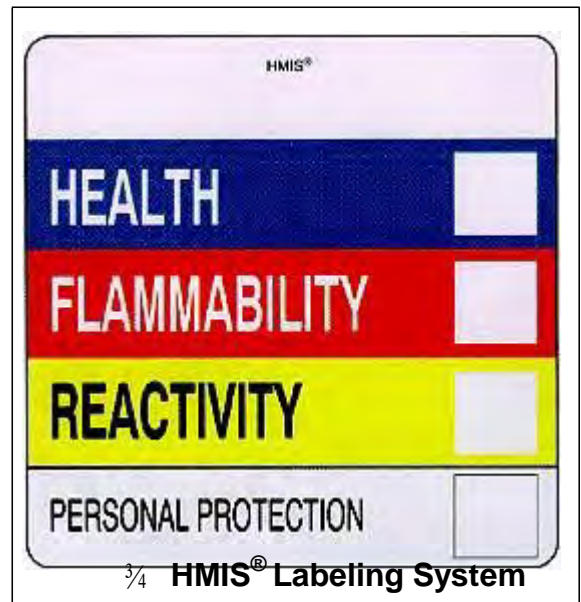
- c. A copy of this process shall be made available to an employee(s) upon hiring. Copies may also be obtained on written request from an employee or a designated representative. Requested copies shall be provided in a timely manner. This process shall also be available to the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee, and the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.
- d. NSE Safety Director will be contacted when a copy of the process is needed.
- e. The process will be updated when new chemicals or hazards are introduced into the working environment, and reviewed annually.
- f. Material Safety Data Sheets shall be required at the time that any chemical product for use in NSE job site is purchased and obtained upon receipt of the chemical product.
- g. Specific operations in NSE job site where hazardous chemicals are used include:
 - $\frac{3}{4}$ vehicle, tools and equipment operations requiring use of fuels and lubricants
 - $\frac{3}{4}$ surface preparation, painting and coating operations requiring the use of abrasive blasting chemical products, paints, solvents and other necessary chemical products
 - $\frac{3}{4}$ welding and hot work where welding rods, solders and other chemical products are required for welding and hot work processes
- h. A Right To Know Station shall be established at each NSE work location. The station shall be prominently displayed at a place where all employees in the area will have immediate and ready access to station contents for information and in case of emergency. A copy of NSE's written Hazard Communication Process, a Chemical Inventory listing all chemicals authorized by NSE for use at the work location, and current copies of the Material Safety Sheet (MSDS) for each chemical product listed in the Chemical Inventory shall be maintained at the station. A master Right To Know Station shall also be maintained at the corporate office and shop facility to employees, their designated representatives, the Assistant Secretary & the Director in accordance with the requirements of 29 CFR 1910.1020(e).
- i. Supervisors and other NSE employees at a work location shall be constantly aware of signs and indications of a potential spill or some other accidental release of chemical product in the job site. Generally, chemical spills and release are noticed visually by observation or because an odor suspected to be from a chemical is noticed. Any such suspicion shall be reported to the Site Supervisor immediately so that emergency response, containment and proper clean-up can be accomplished. Industrial hygiene monitoring and monitoring devices operated by qualified personnel shall also be used as required to detect the presence of chemicals, fumes and vapors.
- j. The process will be updated when new chemicals or hazards are introduced into the working environment, and reviewed annually.

- k. Supervisors and employees shall be aware of the physical and health hazards of chemicals present in the work location through thorough review of MSDS.
- l. MSDS and container labeling shall also be the primary reference information about: preventing exposures; safe work practices; proper selection and use of PPE for working with a chemical product; safe storage of chemical products; properties of the chemical product; emergency and containment/clean-up procedures in the event of a spill or release; and other types of information that is contained in an MSDS.

5. CONTAINER LABELING

- a. The Site Supervisor will be responsible for all containers of hazardous chemicals entering the job site and will assure that the chemical containers are properly labeled with:
 - ¾ chemical name, including product name and identity of the chemical;
 - ¾ hazard warnings about the chemical; and
 - ¾ name and address of the manufacturer, importer, or responsible party
 - ¾ HMIS® labels properly marked (see sample tag at right)

- b. Chemical containers other than the original product container shall be checked and approved by the Site Supervisor or a competent person and the MSDS reviewed to ensure the safety of the alternate container. The Site Supervisor shall ensure that the new container is properly labeled; i.e., that all secondary containers are labeled with an extra copy of the original manufacturer's label or with generic labels which have a block for identity and blocks for the hazard warning. For help with labeling, employees shall contact the Site Supervisor and, if additional assistance is required, NSE's Safety Director. NSE Safety Director shall review the labeling system annually as part of the annual review of this Hazard Communication Process and update as required.



- c. The Site Supervisor will ensure that the contents of piping, gas and transmission lines are properly identified. The Site Supervisor will also inform employees of the hazards associated with chemicals contained in piping within the work areas.

- d. NSE employees shall not remove or deface chemical product labeling.
- e. Chemical product labeling shall be in English. At the same time, if employees on the work location do not speak English as their primary language, the information provided in labeling shall be provided to these employees in their primary language.

6. MATERIAL SAFETY DATA SHEETS (MSDSs)

- a. The corporate office or Site Supervisor, whichever is in charge of purchasing a chemical product, will be responsible for obtaining an MSDS for each product. The Site Supervisor will maintain the MSDS system at the work location. The Site Supervisor will review incoming data sheets for new and significant health/safety information and will ensure that the new information is given to the affected employees. Copies of all MSDS will be kept by the Site Supervisor with copies displayed at the Right To Know Station at the location. The Site Supervisor and Safety Director will review each MSDS annually for accuracy and completeness.
- b. The MSDS system shall include:
 - $\frac{3}{4}$ current master inventory list of all MSDSs indexed alphabetically and by vendor;
 - $\frac{3}{4}$ the identity used on the MSDS shall be the same as used on the container label;
 - $\frac{3}{4}$ the chemical and common name of all ingredients determined to present a hazard shall appear on all MSDS;
 - $\frac{3}{4}$ the MSDS shall list:
 - the physical and chemical characteristics of the chemical including vapor pressure, flash point, etc.;
 - the fire, explosion, and reactivity hazard(s) of the chemical mixture including the boiling point, flash point and auto ignition temperature;
 - health hazards of the chemical mixture including signs and symptoms of exposure and medical conditions recognized as aggravated by exposure with primary route(s) of entry;
 - permissible exposure limit (PEL) or any other exposure limit used or recommended by the manufacturer, importer, or employer;
 - whether on carcinogen listing (NTP) or has been found to be a potential carcinogen (IARC listing) or by OSHA (see Appendix 1 immediately following this process);
 - control measures including fire, engineering, personal protective equipment;

- general precautions for safe handling and use including protective measures during repair and maintenance and procedures for clean-up of spills and leaks;
 - emergency and first aid procedures;
 - date prepared or changed;
 - name, address, telephone numbers of manufacturer, importer, or responsible party to call in an emergency.
- c. The MSDS will be available for use by employees. Each Site Supervisor will keep a current and up-to-date copy of the process on file and in the location's Right To Know Station. New chemicals shall not be used until a MSDS has been obtained and reviewed for health hazards by the Site Supervisor.

7. EMPLOYEE TRAINING AND EDUCATION

- a. Before starting work, the respective Site Supervisor of a new employee will go over their copy of the plan and each MSDS applicable to their job, i.e. handouts, video tapes, etc. Before any new chemical is used, all effected employees will be informed of its use, will be instructed on safe use, and will be trained on hazards associated with the new chemical. All employees will attend additional training, as appropriate, to review the process and MSDS. Appropriate reference material will also be discussed during the training session(s).
- b. The minimum orientation and training for a new employee is as follows:
- $\frac{3}{4}$ an overview of the requirements contained in the Hazard Communication standard, 29 CFR 1926.59;
 - $\frac{3}{4}$ chemicals present in their job site operations and this office;
 - $\frac{3}{4}$ location and availability of the written process;
 - $\frac{3}{4}$ physical and health effects of the hazardous chemicals listed on the inventory list of this process;
 - $\frac{3}{4}$ methods and observation techniques used to determine the presence or release of hazardous chemicals in the work area;
 - $\frac{3}{4}$ how to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment;
 - $\frac{3}{4}$ steps taken by NextSun Energy, LLC, to lessen or prevent exposure to the chemicals listed on the inventory list;
 - $\frac{3}{4}$ emergency procedures to follow if exposed to any chemicals; and

- $\frac{3}{4}$ location of MSDS file and location of hazardous chemicals inventory list.
- c. Prior to a new chemical being introduced into any section of the job site, each employee will be given information and training as outlined above by the Site Supervisor. MSDS must be available prior to use.
- d. After attending the training class, each employee will sign a form to verify that he/she attended the training, that the written plan is made available for review, and that he/she understands the plan.
- e. Before entering a job site, the Site Supervisor will ascertain what hazards employees may be exposed to and then take appropriate action to protect the employees. If the employee has any question about what protection is needed, he/she should contact the Site Supervisor or NSE Safety Director immediately.

8. NON-ROUTINE TASKS

- a. Before any non-routine task is performed, employees shall be advised and/or they must contact the Site Supervisor for special precautions to follow and the supervisor shall inform any other personnel who could be exposed. Non-routine task situations include unlabeled pipes, gas and transmission lines at the work location.
- b. In the event that such tasks are required, the Site Supervisor shall provide the following information about such activity as it relates to the specific chemicals expected to be encountered:
 - $\frac{3}{4}$ specific chemical name(s) and hazard(s);
 - $\frac{3}{4}$ protective personal equipment required and safety measures to be taken;
 - $\frac{3}{4}$ measures that have been taken to lessen the hazards including ventilation, respirators, presence of other employee(s), and emergency procedures.

9. MULTI-EMPLOYER JOB SITES

- a. Employers who produce, use, or store hazardous chemicals at a job site in such a way that the employees or other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication processes developed and implemented under this paragraph (e) include the following:
 - $\frac{3}{4}$ The methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working;

- ¾ The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the job site's normal operating conditions and in foreseeable emergencies; and,
- ¾ The methods the employer will use to inform the other employer(s) of the labeling system used in the job site.

10. OTHER PERSONNEL EXPOSURE (CONTRACTORS AND SUBCONTRACTORS)

- a. It will be the responsibility of the Site Supervisor or Safety Director to provide other personnel or outside contractors with the following information as follows:
 - ¾ hazardous chemicals to which they may be exposed to while in the job site;
 - ¾ measures to lessen the possibility of exposure;
 - ¾ location of MSDS for all hazardous chemicals; and
 - ¾ procedures to follow if they are exposed.
- b. The Site Supervisor or Safety Director will also be responsible for contacting each contractor before work is started to gather and disseminate any information concerning chemical hazards the contractor is bringing into the job site, and vice versa.

APPENDIX 1

The following chemicals are regulated by OSHA as carcinogens in substance-specific standards that include labeling requirements.

- ¾ Asbestos
- ¾ 4-Nitrobyphenyl
- ¾ Alpha-Naphthylamine
- ¾ Methyl Chloromethyl Ether
- ¾ 3,3 Dichlorobenzidine (and its salts)
- ¾ Bis-Chloromethyl Ether
- ¾ Beta-Naphthylamine
- ¾ Benzidine
- ¾ 4-Aminodiphenyl
- ¾ Ethyleneimine
- ¾ Beta-Propiolactone
- ¾ 2-Acetylaminofluorene
- ¾ 4-Dimethylaminoazobenzene
- ¾ N-Nitrosodimethylamine
- ¾ Vinyl Chloride (and poly-vinyl Chloride)
- ¾ Inorganic Arsenic
- ¾ 1,2 Dibromo-3-Chloropropane
- ¾ Acrylonitrile
- ¾ Ethylene Oxide
- ¾ Formaldehyde
- ¾ Benzene

NEXTSUN ENERGY, LLC
Hearing Conservation Process

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NEXTSUN ENERGY, LLC

Hearing Conservation Process

1. **PURPOSE**

This is a developed hearing conservation process for NextSun Energy, LLC (NSE) to comply with CFR 1910.95 and to provide guidelines to protect employees from potential hearing loss.

2. **SCOPE**

This process will establish the minimum hearing protection requirements for:

- s. NextSun Energy, LLC (NSE)
- t. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- u. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **REFERENCE**

29 CFR 1910.95(c)

4. **RESPONSIBILITIES**

- a. Contractors will be responsible for the enforcement and disciplinary action resulting from violation or failure of assigned persons to implement the requirements of this process.
- b. NSE Safety Director shall be responsible to provide for the monitoring of work activities to assure compliance to the requirements of this process.
- c. The primary responsibility for the implementation of the requirements of this process will rest with the Site Supervisors.
- d. Individual employees shall also have responsibility to abide by this process.

5. **REQUIREMENTS**

- a. NSE shall provide protection against the effects of noise exposure in the workplace when the sound levels exceed those shown in Table G-16 below when measured on the A scale of a standard sound level meter at slow response.
- b. When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.
- c. If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.
- d. NSE shall administer a continuing, effective hearing conservation process, as described in this process, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of 50 percent. For purposes of the hearing conservation process, employee noise exposures shall be computed in accordance with appendix A and Table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.
- e. The standard permits an unprotected, 8-hour permissible exposure limit (PEL) of 90 decibel-A scale (dBA) for continuous noise.
- f. Higher unprotected exposure is allowed provided there are sufficient periods of noise exposure low enough to maintain a PEL below 90 dBA.
- g. The maximum allowable exposure level is 110 dBA for 30 minutes.
- h. Unprotected exposure above 110 dBA is not permitted regardless of duration.

OSHA Continuous Noise Exposure Limits Equaling 100% Dose – Table G-16

OSHA PEL, dBA	Maximum Duration Minutes (hrs.)
90	480 (8)
92	360 (6)
95	240 (4)
97	180 (3)
100	120 (2)
102	90 (1½)
105	60 (1)
110	30 (1/2)
115	15 (1/4)

- i. The PEL is based on 100% dose of the allowed exposure. Table G-16 shows the noise level and corresponding time limits that result in a dose of 100%. 92 decibels for 8 hours is the same dose as 110 dBA for 2 hours.
- j. The standard defines impact or impulse noise as noise with the duration of one second or less. The PEL for impact noise is 140 dBA, peak sound level.
- k. The OSHA standard requires that employees be included in a hearing conservation process if their full shift exposure exceeds the action level by 50%. Employees working 12 hour shifts exceed the action level with a 12 hour average noise exposure of 82 dBA. Employees working 12 hour shifts exceed the permissible exposure limit of 100% dose at 87 dBA.
- l. When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, a monitoring process shall be developed and implemented.
- m. When a hearing conservation process is required, it shall be provided at no cost to employees.

6. **HEARING PROTECTION**

- a. Hearing protection devices are available to employees who are exposed to noise above the action level. Employees who have shown a standard threshold shift measured on their annual audiogram must wear hearing protection at all times in the workplace. Hearing protection must be worn when an employee is working in an area above 90 dBA.
- b. There are 2 types of hearing protection devices available. These are the circumoral device, better known as an ear-muff, and the insert device. Each type provides a different degree of protection and the employee must be properly trained in its use to obtain the maximum protection.

$\frac{3}{4}$ Circumoral or "Ear Muffs"

- Circumoral hearing protection seals the area around the entry to the ear canal by means of a liquid or foam filled cushion and has a band connecting each muff. Some models may also be attached to hard hats.
- This type of protection is easily donned and requires minimal training. It does not require fitting.
- They provide noise attenuation in a range of 15-25 dBA.
- The effectiveness of these devices is dependent on the seal around the ear.
- Temple bars on safety glasses can reduce the protection factor of ear muffs.

- One advantage of ear muffs is that they may be used in conjunction with insert type hearing protectors to maximize protection.

¾ Insert or "Ear Plugs"

- Insert devices or "plugs" are available in pre-formed or user-formed styles and may be disposable or non-disposable.
- Insert plugs provide noise reductions in the 20-30 decibel range.
- These devices are inserted into the ear canal by the user and their effectiveness depends on proper insertion.
- Providing training to the user and practice by the user are imperative to insuring a good fit to insure maximum protection.
- NSE shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. The employer shall use one of the evaluation methods described in Appendix B: "Methods for Estimating the Adequacy of Hearing Protection Attenuation."
- Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 90 decibels as required by paragraph (b) of this section.
- For employees who have experienced a standard threshold shift, hearing protectors must attenuate employee exposure to an 8-hour time-weighted average of 85 decibels or below.
- The adequacy of hearing protector attenuation shall be re-evaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation. The employer shall provide more effective hearing protectors where necessary.

7. **AUDIOMETRIC TESTING**

Audiometric testing is a means of determining if an employee's hearing is being adversely affected by noise exposure in the workplace.

- a. Baseline audiogram (when applicable) will be established, against which subsequent audiogram can be compared. This should be accomplished at time of hiring.
- b. This audiometric testing is to establish a baseline, which must be preceded by at least 14 hours without exposure to high noise levels.
- c. Hearing protection may be used prior to the audiometric test to insure the employee is not exposed to high noise levels.

- d. At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram (annual audiogram) for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.
- e. An annual audiogram may be substituted for the baseline audiogram when in the judgment of the audiologist or physician making the evaluation:
 - $\frac{3}{4}$ The standard threshold shift revealed by the audiogram is persistent; or
 - $\frac{3}{4}$ The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.
- f. Annual audiometric testing (when applicable) provides results that should be compared to the baseline to identify any changes in an individual's hearing threshold.
- g. If the audiogram shows a 10 decibel reduction of hearing capability at 2000, 3000, or 4000 Hertz, a repeat audiometric test should be done within 30 days.
- h. This 10 dBA reduction at these frequencies is referred to as a "Standard Threshold Shift" (STS).
- i. A repeat audiogram that shows a permanent threshold shift requires that a full assessment of the hearing loss be completed. Unless a physician has determined that the STS is not work related or aggravated by occupation noise exposure, the employer should insure that:
 - $\frac{3}{4}$ The employee is notified in writing within 21 days of the determination that the STS is permanent.
 - $\frac{3}{4}$ Employees should be trained in the use of hearing protection and required to use the protection devices.
 - $\frac{3}{4}$ The employee should be referred for a clinical audiological or otological examination if additional testing is needed or if Contractors suspects a medical condition is caused or aggravated by wearing hearing protection.

8. EMPLOYEE TRAINING

- a. NSE shall institute a training process for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and shall ensure employee participation in such process.
- b. The training process shall be repeated annually for each employee included in the hearing conservation process. Information provided in the training process shall be updated to be consistent with changes in protective equipment and work processes.

- c. The employer shall ensure that each employee is informed of the following:
- $\frac{3}{4}$ The effects of noise on hearing;
 - $\frac{3}{4}$ The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
 - $\frac{3}{4}$ The purpose of audiometric testing, and an explanation of the test procedures.
 - $\frac{3}{4}$ Training should include information on the physical nature of sounds, the effects of noise on the ear and the proper use of hearing protection.
 - $\frac{3}{4}$ Employees that work in high noise areas (>85 dBA) should also be trained for a basic understanding of noise monitoring, work areas with high noise levels, and the purpose of audiometric testing.
 - $\frac{3}{4}$ Each employee that works in an area above the action level must complete and obtain an acceptable score on the hearing conservation exam.
 - $\frac{3}{4}$ This exam must be maintained in the employee training files at the corporate office.
 - $\frac{3}{4}$ Noise exposure monitoring records should be retained for at least 2 years. Audiometric test results should be retained for the duration of the employee(s) employment plus 30 years.
 - $\frac{3}{4}$ Employees may have access to the noise exposure monitoring records and audiometric test results under the OSHA standard "Access to Employee Exposure and Medical Records", 29 CFR 1910.20. For access to these records, a written request for the records must be made to NSE Safety Director. Written request form will be distributed upon request.

9. **RECORDKEEPING**

- a. NSE shall maintain an accurate record of all employee exposure measurements required by OSHA and this process.
- b. NSE shall retain all employee audiometric test records obtained pursuant to paragraph (g) of this section:
- c. This record shall include:
- $\frac{3}{4}$ Name and job classification of the employee;
 - $\frac{3}{4}$ Date of the audiogram;
 - $\frac{3}{4}$ The examiner's name;

- ¾ Date of the last acoustic or exhaustive calibration of the audiometer; and
- ¾ Employee's most recent noise exposure assessment.
- ¾ NSE shall maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.
- ¾ NSE shall retain records required in this process for at least the following periods.
 - Noise exposure measurement records shall be retained for 2 years.
 - Audiometric test records shall be retained for the duration of the affected employee's employment.
 - All records required by this section shall be provided upon request to employees, former employees, representatives designated by the individual employee, and the Assistant Secretary.
 - If NSE ceases to do business, NSE shall transfer to the successor employer all records required to be maintained by this section, and the successor employer shall retain them for the remainder of the period prescribed in this process.

NEXTSUN ENERGY, LLC

Lead Safety Process

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NEXTSUN ENERGY, LLC

Lead Safety & Compliance Process

1. PURPOSE

The purpose of these guidelines is to minimize the lead and respirable dust exposure potentials of personnel performing abrasive blasting, welding, cutting, brazing or other work on painted or primed material.

2. SCOPE

- a. This process applies to all work locations where the following could be occupationally exposed to lead:
 - $\frac{3}{4}$ NextSun Energy, LLC (NSE)
 - $\frac{3}{4}$ All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
 - $\frac{3}{4}$ All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.
- b. Work activities covered include but are not limited to the following:
 - $\frac{3}{4}$ Demolition or salvage of structures where lead or materials containing lead is present
 - $\frac{3}{4}$ Removal or encapsulation of materials containing lead
 - $\frac{3}{4}$ New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead
 - $\frac{3}{4}$ Installation of products containing lead
 - $\frac{3}{4}$ Lead contamination/emergency cleanup
 - $\frac{3}{4}$ Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed, and
 - $\frac{3}{4}$ Maintenance operations associated with the construction activities described in this paragraph.

3. **REFERENCES**

29 CFR 1926.62

4. **DEFINITIONS**

- a. *Action level*- means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m³) calculated as an 8-hour time-weighted average (TWA).
- b. *Competent person*- means one who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them.
- c. *Lead*- means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

5. **RESPONSIBILITIES**

The Site Supervisor in charge of the worksite will ensure that these procedures are followed by the personnel performing the work. This individual will ensure that personal protective equipment (PPE) requirements outlined in this plan are followed pertinent to the job at hand.

The Site Safety Supervisor will be designated competent person as mentioned in the OSHA Lead Standard. As such, he or she is responsible for assuring that supervisors of work involving potential lead exposures have been trained in the content of this process and are capable of implementing this procedure.

6. **GENERAL REQUIREMENTS**

- a. In the event that a NSE project should present a potential exposure to airborne lead at any level, NSE shall establish and implement a written compliance process to reduce exposures to or below the permissible exposure limit, and interim levels if applicable, solely by means of engineering and work practice controls.
- b. Written plans for these compliance processes shall include at least the following:
 - ³/₄ A description of each operation in which lead is emitted; e.g. machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices
 - ³/₄ A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead

- ¾ A report of the technology considered in meeting the permissible exposure limit
 - ¾ Air monitoring data which documents the source of lead emissions
 - ¾ A detailed schedule for implementation of the process, including documentation such as copies of purchase orders for equipment, construction contracts, etc.
 - ¾ A work practice process which includes items required by OSHA
 - ¾ An administrative control schedule as required by OSHA, if applicable
 - ¾ Other relevant information
- c. Written processes shall be submitted upon request to the Assistant Secretary and the Director, and shall be available at the worksite for examination and copying by the Assistant Secretary, Director, and any affected employee or authorized employee representatives.
 - d. Written processes shall be revised and updated at least every 6 months to reflect the current status of the process.
 - e. Should a NSE project present a potential exposure to airborne lead at any level, NSE shall inform employees of the content of Appendices A and B that accompany this process.
 - f. NSE shall ensure that no employee is exposed to lead at concentrations greater than 50 micrograms per cubic meter of air (50 ug/m³) averaged over an 8-hour period. If an employee is exposed to lead for more than 8 hours in any work day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:
Maximum permissible limit (in ug/m³)=400 divided by hours worked in the day.
 - g. When respirators are used to supplement engineering and work practice controls to comply with the PEL and all process respiratory protection requirements have been met, employee exposure, for the purpose of determining whether NSE has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.
 - h. NSE shall institute a training process for and ensure the participation of all employees who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritation exists.
 - i. NSE shall provide initial training by 180 days from the effective date for those employees covered by this process prior to the time of initial job assignment for those employees subsequently covered.

- j. The training process shall be repeated at least annually for each employee.
- k. For the purposes of exposure monitoring, employee exposure shall be considered to mean that exposure which would occur if the employee were not using a respirator.
- l. With the exception of monitoring used as a basis for initial determination, NSE shall collect full shift (for at least 7 continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.
- m. Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.
- n. Initial determination shall be made regarding whether NSE has a project or work operation covered by this process to determine if any employee may be exposed to lead at or above the OSHA action level.
- o. If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit, NSE shall repeat monitoring in accordance with this paragraph at least every 6 months. NSE shall continue monitoring at the required frequency until at least 2 consecutive measurements, taken at least 7 days apart, are below the action level at which time NSE may discontinue monitoring for that employee except when additional monitoring is required.
- p. If the initial monitoring reveals that employee exposure is above the permissible exposure limit NSE shall repeat monitoring quarterly. NSE shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the PEL but at or above the action level at which time NSE shall repeat monitoring for that employee at the frequency specified in the previous paragraph except when additional monitoring is required.
- q. For purposes of this process, "additional monitoring" shall mean monitoring that is performed whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever NSE has any other reason to suspect a change which may result in new or additional exposures to lead.
- r. Within 5 working days after the receipt of monitoring results, NSE shall notify each employee in writing of the results which represent that employee's exposure.
- s. Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, NSE shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit.
- t. Where any employee is exposed to lead above the permissible exposure limit for more than 30 days per year, NSE shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure to lead in

accordance with the implementation schedule in Table I in 1910.1025 (e)(1)(ii), except to the extent that NSE can demonstrate that such controls are not feasible.

- u. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, NSE shall nonetheless use them to reduce exposures to the lowest feasible level and shall supplement them by the use of respiratory protection which complies with the respiratory protection requirements of this process.
- v. Where any employee is exposed to lead above the permissible exposure limit, but for 30 days or less per year, NSE shall implement engineering controls to reduce exposures to 200 ug/m(3), but thereafter may implement any combination of engineering, work practice (including administrative controls), and respiratory controls to reduce and maintain employee exposure to lead to or below 50 ug/m(3)

7. RESPIRATORY PROTECTION

- a. For employees who use respirators required by this section, NSE must provide respirators that comply with OSHA requirements. Respirators must be used during:
 - ³/₄ Periods necessary to install or implement engineering or work-practice controls
 - ³/₄ Work operations for which engineering and work-practice controls are not sufficient to reduce employee exposures to or below the permissible exposure limit
 - ³/₄ Periods when an employee requests a respirator
- b. NSE must implement a respiratory protection process in accordance with 29 CFR 1910.134 (b) through (d) (except (d)(1)(iii)), and (f) through (m). If an employee has breathing difficulty during fit testing or respirator use, NSE must provide the employee with a medical examination to determine whether or not the employee can use a respirator while performing the required duty.

TABLE II.—RESPIRATORY PROTECTION FOR LEAD AEROSOLS

Airborne concentration of lead or condition of use	Required respirator
Not in excess of 0.5 mg/m ³ (10X PEL)	Half-mask, air-purifying respirator equipped with high efficiency filters. ^{2,3}
Not in excess of 2.5 mg/m ³ (50X PEL)	Full facepiece, air-purifying respirator with high efficiency filters. ²
Not in excess of 50 mg/m ³ (1000X PEL)	(1) Any powered, air-purifying respirator with high efficiency filters ² ; or (2) Half-mask supplied-air respirator operated in positive-pressure mode. ²
Not in excess of 100 mg/m ³ (2000X PEL)	Supplied-air respirators with full facepiece, hood, helmet, or suit, operated in positive pressure mode.
Greater than 100 mg/m ³ , unknown concentration or fire fighting.	Full facepiece, self-contained breathing apparatus operated in positive-pressure mode.

¹ Respirators specified for high concentrations can be used at lower concentrations of lead.
² Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.
³ A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

- c. NSE must select the appropriate respirator or combination of respirators from Table II above.
- d. NSE must provide a powered air-purifying respirator instead of the respirator specified in Table II of this section when an employee chooses to use this type of respirator and such a respirator provides adequate protection to the employee.
- e. Respirator Selection:
 - ³/₄ Once typical worker exposures are determined for specific work activities, the following chart should be used as a guide for respirator selection.

Airborne concentration of lead or condition of use	Required respirator
Not in excess of 500 ug/m(3) <i>Continued on next page</i>	<ul style="list-style-type: none"> - 1/2 mask air purifying respirator with high efficiency filters - 1/2 mask supplied air respirator operated in demand (negative pressure) mode
<i>Continued from previous page</i> Not in excess of 1,250 ug/m(3)	<ul style="list-style-type: none"> - Loose fitting hood or helmet powered air purifying respirator with high efficiency filters - Hood or helmet supplied air respirator operated in a continuous-flow mode - e.g., type CE abrasive blasting respirators operated in a continuous-flow mode
Not in excess of 2,500 ug/m(3)	<ul style="list-style-type: none"> - Full facepiece air purifying respirator with high efficiency filters - Tight fitting powered air purifying respirator with high efficiency filters - Full facepiece supplied air respirator operated in demand mode - 1/2 mask or full facepiece supplied air respirator operated in a continuous-flow mode - Full facepiece self-contained breathing apparatus (SCBA) operated in demand mode.
Not in excess of 50,000 ug/m(3)	<ul style="list-style-type: none"> - 1/2 mask supplied air respirator operated in pressure demand or other positive-pressure mode
Not in excess of 100,000 ug/m(3)	<ul style="list-style-type: none"> - Full facepiece supplied air respirator operated in pressure demand or other positive-pressure mode - e.g., type CE abrasive blasting respirators operated in a positive-pressure mode
Greater than 100,000 ug/m(3), unknown concentration.	<ul style="list-style-type: none"> - Full facepiece SCBA operated in pressure demand or other positive-pressure mode

- f. If an employee is exposed to lead above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, NSE shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

- $\frac{3}{4}$ Coveralls or similar full-body work clothing;
 - $\frac{3}{4}$ Gloves, hats, and shoes or disposable shoe coverlets; and
 - $\frac{3}{4}$ Face shields, vented goggles, or other appropriate protective equipment
 - $\frac{3}{4}$ NIOSH-certified respirators, as required
- g. NSE shall institute a medical surveillance process for all employees who are, or may be, exposed above the action level for more than 30 days per year. NSE shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician. NSE shall provide the required medical surveillance including multiple physician review without cost to employees and at a reasonable time and place.
- h. NSE shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee who was or may have been exposed above the action level for more than 30 days per year on the following schedule:
 - $\frac{3}{4}$ At least every 6 months to each employee covered under paragraph (j)(1)(i) of this section
 - $\frac{3}{4}$ At least every 2 months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 ug/100 g of whole blood. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 ug/100 g of whole blood
AND
 - $\frac{3}{4}$ At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.
- i. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal, NSE shall provide a second (follow-up) blood sampling test within two weeks after NSE receives the results of the first blood sampling test.
- j. Within 5 working days after the receipt of biological monitoring results, the employer shall notify in writing each employee whose blood lead level exceeds 40 ug/100 g of that employee's blood lead level and that the standard requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal.
- k. NSE shall provide for decontamination, changing and hygiene facilities in accordance with OSHA requirements. Warning signs that are in accordance with OSHA requirement for lead hazards shall be posted in the work area. Signs shall be durable and shall not be removed or defaced.

8. **ABRASIVE BLASTING MATERIAL**

Silica sand should not normally be used for abrasive blasting except for approved blasting purposes. Other abrasive blasting materials such as Black Beauty, iron ore slag, coke oven slag, or water blasting should be used. The Site Supervisor is responsible for the selection and approval of abrasive blasting materials.

9. **PAINTING**

Most paints used within our worksites contain at least minor quantities of lead. To assure that exposure potential to lead while applying paint is minimal; the following PPE must be worn:

a. Rolling or brush application:

- ¾ A minimum of a half-mask respirator required, affixed with an organic vapor/high efficiency filter cartridge

b. Spray Application:

- ¾ Same respirator required as for rolling/brush application, plus protective clothing consisting of prylon suit and goggles

10. **SAFE WORK REQUIREMENTS FOR COATED SURFACES**

a. Compliance Process:

- ¾ Prior to commencing work involving a coated surface a written compliance process will be prepared by the Site Supervisor using the form in Attachment “A” Job Compliance Plan. An example of a completed form is provided in Attachment “B”.
- ¾ The individuals directly supervising the work shall have a copy of the appropriate plan and review it prior to beginning work to assure that the work practices plan agree with those described in the written plan.
- ¾ The Site Supervisor preparing the Job Compliance Plan shall forward a copy to NSE Safety Director.

b. Exposure Assessment:

- ¾ Upon receiving a completed Job Compliance Plan and before the work begins, the Site Supervisor will evaluate the lead exposure activities and schedule monitoring if appropriate. Client data, if available, may be used during this determination process.
- ¾ Worker exposure monitoring will be conducted if previous baseline monitoring data for similar work has not been established.

- ³/₄ NSE will work with the client company to monitor the potential employee lead exposure by using individual and fixed monitoring devices before and during work activity where lead exposure is known or suspected.
- ³/₄ Exposure monitoring will be performed in accordance with OSHA 29 CFR 1910.1025(d) or 29 CFR 1910.62(d). For defining monitoring requirements, worker exposure is that exposure that would occur if the worker were not wearing respiratory protection.
- ³/₄ The action level of 30 micrograms per cubic meter of air (30 ug/m cubed) or greater is the exposure assessment level that warrants the use of engineering controls and/or respiratory protection.

Frequency of exposure monitoring shall be as follows:

- Monitoring during the first day of work to establish the worker exposure levels and verify the appropriate respiratory protection requirements.
- Once personnel lead exposures are determined to be below the action level of 30 ug/m cubed, further monitoring is not necessary unless there is a change in the work environment, process or procedures. Proper documentation requires two consecutive samples taken during the same work activity, taken at least 7 days apart, give results less than 30 ug/m cubed.
- If personnel exposures are determined to be between 30 ug/m cubed and 50 ug/m cubed, monitoring shall be conducted quarterly until 2 consecutive samples collected during the same work activity, collected at least seven days apart are less than 50 ug/m cubed and greater than 30 ug/m cubed. Then monitoring will be conducted every six months.
- If personnel exposures are found to be above 50 ug/m cubed, monitoring shall be conducted quarterly
- For abrasive blasting, additional monitoring for respirable dust/particulate matter should be conducted.

c. Personnel Monitoring Notification:

- ³/₄ All personnel whose exposures are monitored will be notified of their results within 5 working days of the receipt of the results by NSE. When results indicate that, without respirators, the worker was or would have been exposed to airborne levels at or above the permissible exposure limit (PEL) of 50 ug/m cubed, we will assure that the monitored worker is informed of the results. In addition, a written description of corrective action taken (additional engineering controls, administrative controls or respiratory protection equipment requirements) to be taken to reduce exposures below the PEL will be provided.

³/₄ NSE Safety Director is responsible for issuing worker notifications.

d. Activities Involving Unknown Lead Content:

- ³/₄ We will assume that any painted or primed surface contains some measurable quantity of lead. The following PPE requirements are specified when performing work tasks on painted surfaces when either the worker exposure levels are unknown or worker exposure monitoring is being performed:
- ³/₄ A half mask air purifying respirator with a high efficiency filter must be worn when performing the following task:
 - Where lead containing coatings are present:
 - Manual demolition of structures
 - Manual sanding
 - Manual scraping
 - Heat gun applications
 - Power tool cleaning such as grinding, needle gun use or buffer use without dust collector systems
 - Spray painting with lead containing paint
- ³/₄ A full face air purifying respirator with a high efficiency filter or full face supplied air respirator operated in either the demand or continuous flow mode must be worn when performing the following task
 - Using lead containing mortar and lead burning;
 - Clean up activities where dry expendable abrasives are used;
 - Abrasive blasting enclosure movement and removal.
- ³/₄ A full face supplied air respirator operated in the positive pressure mode must be worn when performing the following tasks:
 - Abrasive blasting
 - Welding
 - Cutting
 - Torch burning

- ¾ The following protective clothing must be worn when performing all tasks:
- Coveralls or similar full body work clothing;
 - Gloves, hats, and shoes or disposable shoe coverlets;

 - Face shields, vented goggles or equivalent.

Warning: Anyone who cleans or launders protective clothing must be warned in writing of the potentially harmful effects of lead exposure. The clothing must be double bagged and labeled *“Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state or federal regulations.”*

- e. All protective clothing must be removed at the end of the work shift only in change areas specifically provided. The protective clothing must be cleaned, laundered or disposed of properly. Lead removal from clothing by blowing, shaking or other means which could disperse lead to the air is prohibited.
- f. Change Areas:
- ¾ Change areas must be provided with separate storage facilities for protective work clothing and street clothing which prevent cross contamination.
 - ¾ Protective clothing cannot be worn outside the work place or into designated eating or smoking areas.
- g. Hand Washing Facilities:
- ¾ Adequate hand washing facilities must be provided.
 - ¾ Hands and faces must be washed at the end of each work period.
- h. Medical surveillance:
- ¾ All of our personnel who are or may be exposed to 30 ug/m cubed of lead for more than 30 days a year shall be included in a medical surveillance process. This process will include pre-assignment and periodic medical examinations.
 - ¾ Additional medical examinations will be made available if lead exposed workers:
 - Develop signs or symptoms of lead intoxication.
 - Desire medical advice relative to current or past exposure effect on the ability to procreate a healthy baby.

- Become or are pregnant.
 - Experience difficulty during respirator fit test or during respirator use.
- ¾ The medical examination must include a detailed work history and medical history, a thorough physical examination, blood pressure measurement and a series of laboratory tests designed to check blood chemistry and kidney function.
- ¾ Biological monitoring (blood sampling and analysis for lead and zinc protoporphyrin levels) shall be performed:
- On all personnel who may be exposed to airborne lead levels of 30 ug/m cubed for more than 30 days a year. If exposures are unknown, testing shall be at least once every 6 months.
 - For each individual whose last blood sample and analysis indicate a blood level at or above 30 ug/100 g of whole blood. The tests should be repeated within 2 weeks of receiving the elevated level and then performed every 2 months until 2 consecutive analyses indicate results below 30 ug/100 g.
- ¾ Analysis shall be conducted by a laboratory licensed by the Center for Disease Control, United States Department of Health, Education and Welfare (CDC) or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior twelve months.
- i. Notification of Medical Monitoring Results:
- ¾ All personnel who are tested will be notified of their results and any respective medical interpretation in writing within 5 working days of receipt of these results from the physician.
- ¾ NSE Safety Director is responsible for issuing these notifications.
- j. Medical Removal:
- ¾ An individual shall be temporarily removed from work:
- Whenever periodic and blood sampling test indicates that his/her blood level is at or above 40 ug/100 g of whole blood
 - Whenever a final medical determination places the individual at increased risk of medical impairment to health from exposure to lead

k. Return to Work:

³/₄ Personnel may return to their former job status as long as the following conditions are met:

- Whenever 2 consecutive blood level tests indicate that the individual's blood level is at or below 30 ug/100 g.
- Whenever a subsequent final medical determination no longer places the individual at risk of medical impairment to health from lead exposure

l. Barricades, Signs and Lead Containment:

For all lead abatement work, the area shall be barricaded and signs posted so that other employees not involved in the work will not be exposed to lead. The signs shall be illuminated and cleaned so as to remain visible.

³/₄ Airborne lead content less than 30 ug/m cubed:

- No requirements.

³/₄ Airborne lead greater than 30 ug/m cubed:

- Signs must be posted stating "Warning. Lead Work Area, Poison, No Smoking or Eating" in work areas where other employees are working such as in an operating unit.
- Where employees could be exposed to lead because of the lead abatement work, the lead abatement work area must be contained. In remote areas, such as tank farms, containment may consist of the ground around the lead abatement area.

m. Recordkeeping and Retention:

Records of all exposure monitoring results will be maintained by us for at least the duration of the employee employment.

³/₄ Exposure monitoring records shall include:

- The dates, number, duration, location and results of each of the samples taken including a description of the sampling procedure used to determine representative employee exposure.
- A description of the sampling and analytical methods used and evidence of their accuracy.
- The type of respiratory protective devices worn.

- Name, Social Security number, and job classification of the employee monitored and all other employees whose exposure the measurement is intended to represent.
- The environmental variables that could affect the measurement of employee exposure.

11. TRAINING MODULE

a. Training Requirements:

- $\frac{3}{4}$ Employees will be given training prior to the time of their job assignments.
- $\frac{3}{4}$ The training will occur at least annually after the initial training has been conducted.

b. Testing Requirements:

- $\frac{3}{4}$ A score of between 80% and 100% will require a review of missed questions, if any, and the score corrected to 100%.
- $\frac{3}{4}$ A score of below 80% will require complete retraining and testing.

c. Training Contents:

- $\frac{3}{4}$ Lead Compliance Process - all sections
- $\frac{3}{4}$ Videos (Current videos may be used at the instructor's discretion.)
- $\frac{3}{4}$ Handouts (See Attachment "C" and "D")
- $\frac{3}{4}$ Written Test (See Page 15)

ATTACHMENT "A"

NEXTSUN ENERGY, LLC

Job Compliance Plan for Lead Abatement Work

Date: _____

Project Information:

Number: _____ Start Date: _____ Completion Date: _____

Location: _____ Name: _____

Manager: _____ Competent Person: _____

1.	Work activity description:
2.	Equipment used and material involved:
3.	Controls in place:
4.	Crew size and employee job responsibilities:
5.	Operating procedures and/or maintenance practices:
6.	Description of specific means that will be employed to achieve compliance and, when engineering controls are required, engineering plans and studies used to determine methods selected for controlling exposure to lead:

7.	Summary of technology/controls considered in meeting the PEL:
8.	Attach previous data documenting lead exposure levels if available. Yes Not Available
9.	Detailed schedule for implementation of this plan:
10.	Work practice plan which includes: respiratory protection, protective clothing and equipment, housekeeping, hygiene facilities and practices, and other relevant work practices:
11.	Administrative control schedule, if applicable. Administrative controls is a job rotation schedule which includes: <ul style="list-style-type: none"> • Name and identification number of each affected employee • Duration and exposure levels at each job or work station where each affected employee is located • Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead
12.	Description of arrangements made among contractors on multi-contractor sites with respect to informing affected employees of potential exposure to lead and with respect to responsibility for compliance with 1926.16.
13.	Other relevant information.
14.	Employee blood levels attached. Yes No (Include test date, blood lead level and employee ID)

Prepared By: _____
Name Signature Date

Approved By: _____
Name Signature Date

ATTACHMENT “B”

EXAMPLE

JOB COMPLIANCE PLAN FOR LEAD ABATEMENT WORK

Date: 3/24/03

Job Start Date:3/26/03

Stop Date:3/30/03

Job Number: x1x-03

Location: BAYTANK

Project Supt. I.M. Encharge

Competent Person: I.B. Smarter

1.	<p>Work activity description:</p> <p><i>Weld a 4 inch flange onto a line. The line is painted with lead based paint and primer.</i></p>
2.	<p>Equipment used and material involved:</p> <p><i>Welding and cutting equipment, hand grinder and welding rods.</i></p>
3.	<p>Controls in place:</p> <p><i>25 foot area around work activity will be barricaded to restrict access, local exhaust ventilation will be used during welding and cutting.</i></p>
4.	<p>Crew size and employee job responsibilities:</p> <p><i>1 welder to cut pipe and weld on flange 1 helper to grind and clean welds, etc.</i></p>
5.	<p>Operating procedures and/or maintenance practices:</p> <p><i>Maintenance practice for field welding on a flange is attached.</i></p>
6.	<p>Description of specific means that will be employed to achieve compliance and, when engineering controls are required, engineering plans and studies used to determine methods selected for controlling exposure to lead:</p> <p><i>Local exhaust ventilation will be used during the welding and cutting operation.</i></p>
7.	<p>Summary of technology/controls considered in meeting the PEL:</p> <p><i>Use of respirator as defined in Lead Compliance Process.</i></p>
8.	<p>Attach previous data documenting lead exposure levels if available. Yes No</p> <p><i>Attached copy of previous data supplied by the client for similar work.</i></p>

9.	<p>Detailed schedule for implementation of this plan.</p> <p><i>Local exhaust ventilation will be used from the start of the job and continue until the work is completed.</i></p>
10.	<p>Work practice plan which includes: respiratory protection, protective clothing and equipment, housekeeping, hygiene facilities and practices, and other relevant work practices.</p> <p><i>The welder and helper will wear full facepiece supplied air respirator operated in the pressure demand mode until it can be demonstrated by air monitoring that the respirator requirements can be modified. The immediate work area will be kept clean of accumulation of dust. Eating, drinking and smoking shall be prohibited in areas where lead exposure may occur. The following will be provided for employee use:</i></p> <ul style="list-style-type: none"> • <i>Change area</i> • <i>Showers</i> • <i>Eating area</i> • <i>Hand washing facilities</i>
11.	<p>Administrative control schedule, if applicable. Administrative controls is a job rotation schedule which includes:</p> <ul style="list-style-type: none"> • Name and identification number of each affected employee. • Duration and exposure levels at each job or work station where each affected employee is located. • Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead. <p><i>N/A</i></p>
12.	<p>Description of arrangements made among contractors on multi-contractor sites with respect to informing affected employees of potential exposure to lead and with respect to responsibility for compliance with 1926.16.</p> <p><i>25 foot area around the work activity will be barricaded to restrict access.</i></p>
13.	<p>Other relevant information.</p> <p><i>N/A</i></p>
14.	<p>Employee blood levels attached. Yes No (Include test date, blood lead level and employee ID)</p> <p><i>Attached</i></p>

Prepared By: U.R. Foreman Date: 3/26/03

Approved By: S.S. Supervisor Date: 3/27/03

ATTACHMENT "C"

Reference: 1926.62 Appendix A, Substance Data Sheet for Occupational Exposure to Lead

I. SUBSTANCE IDENTIFICATION

- A. "Substance": Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.
- B. "Compounds Covered by the Standard": The word "lead" when used in this interim final standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.
- C. "Uses": Exposure to lead occurs in several different occupations in the construction industry, including demolition or salvage of structures where lead or lead - containing materials are present; removal or encapsulation of lead - containing materials, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead; installation of products containing lead. In addition, there are construction related activities where exposure to lead may occur, including transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and maintenance operations associated with construction activities
- D. "Permissible Exposure": The permissible exposure limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 ug/m(3)), averaged over an 8-hour workday.
- E. "Action Level": The interim final standard establishes an action level of 30 micrograms of lead per cubic meter of air (30 ug/m(3)), averaged over an 8-hour workday. The action level triggers several ancillary provisions of the standard such as exposure monitoring, medical surveillance, and training.

II. HEALTH HAZARD DATA

- A. "Ways in which lead enters your body". When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin.
- B. When lead is scattered in the air as a dust, fume, or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion. A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.
- C. "Effects of overexposure to lead"
 - $\frac{3}{4}$ "Short term (acute) overexposure". Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardio respiratory arrest. A short term dose of lead can

lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

- ³/₄ "Long-term (chronic) overexposure". Chronic overexposure to lead may result in severe damage to your blood - forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain. Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease of the nervous system called peripheral neuropathy. Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about 2/3 of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible. Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.
- ³/₄ "Health protection goals of the standard". Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that a worker's blood lead level (BLL, also expressed as PbB) be maintained at or below 40 micrograms per deciliter of whole blood (40 ug/dl). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 ug/dl to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of your blood lead level (BLL) is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels are most often reported in units of milligrams (mg) or micrograms (ug) of lead (1 mg=1000 ug) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These 3 units are essentially the same. Sometime BLLs are expressed in the form of mg percent or ug percent. This is a shorthand notation for 100g, 100 ml, or dl. (References to BLL measurements in this standard are expressed in the form of ug/dl.) BLL measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, your BLL is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease. Once your blood lead level climbs above 40 ug/dl, your risk of disease increases. There is a wide variability of individual

response to lead, thus it is difficult to say that a particular BLL in a given person will cause a particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150 ug/dl. Other studies have shown other forms of diseases in some workers with BLLs well below 80 ug/dl. Your BLL is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated BLLs. The longer you have an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead - related impairments and diseases -- both short term and long term -- is to maintain your BLL below 40 ug/dl. The provisions of the standard are designed with this end in mind. Your employer has prime responsibility to assure that the provisions of the standard are complied with both by NSE and by individual workers. You, as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his or her actions.

- III. "Reporting signs and symptoms of health problems". You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead or your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases, your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place. The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if your employer selected the initial physician.

ATTACHMENT “D”

Reference: 1926.62 App B., Employee Standard Summary

This appendix summarizes key provisions of the interim final standard for lead in construction that you as a worker should become familiar with.

I. Permissible Exposure Limit (PEL) - Paragraph (C)

The standard sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air (50 ug/m³), averaged over an 8-hour workday which is referred to as a time-weighted average (TWA). This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. However, since this is an 8-hour average, short exposures above the PEL are permitted so long as for each 8-hour work day your average exposure does not exceed this level. This interim final standard, however, takes into account the fact that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this situation, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be 40 ug/m³.

II. Exposure Assessment - Paragraph (D)

- A. If lead is present on your project in any quantity, your employer is required to make an initial determination of whether any employee's exposure to lead exceeds the action level (30 ug/m³ averaged over an 8-hour day). Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires your employer to monitor workers' exposures unless he or she has objective data which can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment until such time that conditions have changed and the determination is no longer valid.
- B. Objective data may be compiled from various sources, e.g., insurance companies and trade associations and information from suppliers or exposure data collected from similar operations. Objective data may also comprise previously collected sampling data including area monitoring. If it cannot be determined through using objective data that worker exposure is less than the action level, your employer must conduct monitoring or must rely on relevant previous personal sampling, if available.
- C. Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past 12 months, he or she may use these results, provided they are applicable to the same employee tasks and exposure conditions and meet the requirements for accuracy as specified in the standard. As with objective data, if such results are relied upon for the initial determination, your employer must establish and maintain a record as to the relevancy of such data to current job conditions. If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information

or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination.

- D. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level, your employer must set up an air monitoring process to determine the exposure level representative of each employee exposed to lead at your project. In carrying out this air monitoring process, your employer is not required to monitor the exposure of every employee, but he or she must monitor a representative number of employees and job types.
- E. Enough sampling must be done to enable each employee's exposure level to be reasonably representing full shift exposure. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. Sampling performed in the past 12 months may be used to determine exposures above the action level if such sampling was conducted during work activities essentially similar to present work conditions. The standard lists certain tasks which may likely result in exposures to lead in excess of the PEL and, in some cases, exposures in excess of 50 times the PEL. If you are performing any of these tasks, your employer must provide you with appropriate respiratory protection, protective clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until such time that an exposure assessment is conducted which demonstrates that your exposure level is below the PEL.
- F. If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing within 5 working days of the air monitoring results which represent your exposure. If the results indicate that your exposure exceeds the PEL (without regard to your use of a respirator), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that has been taken or will be taken to reduce your exposure. Your exposure must be rechecked by monitoring, at least every 6 months if your exposure is at or over the action level but below the PEL.
- G. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least 7 days apart, are at or below the action level. Air monitoring must be repeated every 3 months if you are exposed over the PEL. Your employer must continue monitoring for you at this frequency until 2 consecutive measurements, taken at least 7 days apart, are below the PEL but above the action level, at which time your employer must repeat monitoring of your exposure every 6 months and may discontinue monitoring only after your exposure drops to or below the action level. However, whenever there is a change of equipment, process, control, or personnel or a new type of job is added at your project which may result in new or additional exposure to lead; your employer must perform additional monitoring.

III. Methods of Compliance - Paragraph (E)

- A. Your employer is required to assure that no employee is exposed to lead in excess of the PEL as an 8-hour TWA. The interim final standard for lead in construction requires employers to institute engineering and work practice controls including administrative controls to the extent feasible to reduce employee exposure to lead. Where such controls are feasible but not adequate to reduce exposures below the PEL they must be used nonetheless to reduce exposures to the lowest level that can be accomplished by these means and then supplemented with appropriate respiratory protection.

- B. Your employer is required to develop and implement a written compliance process prior to the commencement of any job where employee exposures may reach the PEL as an 8-hour TWA. The interim final standard identifies the various elements that must be included in the plan. For example, employers are required to include a description of operations in which lead is emitted, detailing other relevant information about the operation such as the type of equipment used, the type of material involved, employee job responsibilities, operating procedures and maintenance practices. In addition, your employer's compliance plan must specify the means that will be used to achieve compliance and, where engineering controls are required, include any engineering plans or studies that have been used to select the control methods. If administrative controls involving job rotation are used to reduce employee exposure to lead, the job rotation schedule must be included in the compliance plan. The plan must also detail the type of protective clothing and equipment, including respirators, housekeeping and hygiene practices that will be used to protect you from the adverse effects of exposure to lead.
- C. The written compliance process must be made available, upon request, to affected employees and their designated representatives, the Assistant Secretary and the Director. Finally, the plan must be reviewed and updated at least every 6 months to assure it reflects the current status in exposure control.

IV. Respiratory Protection - Paragraph (F)

- A. Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level is not above the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects.
- B. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection. Your employer is required to select respirators from the types listed in Table I of the Respiratory Protection section of the standard. Any respirator chosen must be approved by the Mine Safety and Health Administration (MSHA) or the National Institute for Occupational Safety and Health (NIOSH). This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure.
- C. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present at your project. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time. The standard provides that you can obtain a PAPR upon request.

- D. Your employer must also start a Respiratory Protection Process. This process must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators.
- E. Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make 2 or 3 different mask types available. In order to assure that your respirator fits properly and that facepiece leakage is minimized, your employer must give you either a qualitative fit test or a quantitative fit test (if you use a negative pressure respirator) in accordance with Appendix D. Any respirator which has a filter, cartridge or canister which cleans the work room air before you breathe it, and which requires the force of your inhalation to draw air thru the filtering element is a negative pressure respirator. A positive pressure respirator supplies air to you directly. A quantitative fit test uses a sophisticated machine to measure the amount, if any, of test material that leaks into the facepiece of your respirator.
- F. You must also receive from your employer proper training in the use of respirators. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations. Your employer must test the effectiveness of your negative pressure respirator initially and at least every 6 months thereafter with a "qualitative fit test." In this test, the fit of the facepiece is checked by seeing if you can smell a substance placed outside the respirator. If you can, there is appreciable leakage where the facepiece meets your face. The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty in breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

V. Protective Work Clothing and Equipment - Paragraph (G)

- A. If you are exposed to lead above the PEL as an 8-hour TWA, without regard to your use of a respirator, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 ug/m³. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. In addition, your employer is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment.
- B. The interim final standard requires that your employer assure that you follow good work practices when you are working in areas where your exposure to lead may exceed the PEL. With respect to protective clothing and equipment, where appropriate, the following procedures should be observed prior to beginning work:

- ¾ Change into work clothing and shoe covers in the clean section of the designated changing areas;
- ¾ Use work garments of appropriate protective gear, including respirators before entering the work area; and
- ¾ Store any clothing not worn under protective clothing in the designated changing area.

C. Workers should follow these procedures upon leaving the work area:

- ¾ HEPA vacuum heavily contaminated protective work clothing while it is still being worn. At no time may lead be removed from protective clothing by any means which result in uncontrolled dispersal of lead into the air
- ¾ Remove shoe covers and leave them in the work area
- ¾ Remove protective clothing and gear in the dirty area of the designated changing area. Remove protective coveralls by carefully rolling down the garment to reduce exposure to dust
- ¾ Remove respirators last; and
- ¾ Wash hands and face

D. Workers should follow these procedures upon finishing work for the day (in addition to procedures described above):

- ¾ Where applicable, place disposal coveralls and shoe covers with the abatement waste
- ¾ Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room
- ¾ Clean protective gear, including respirators, according to standard procedures
- ¾ Wash hands and face again. If showers are available, take a shower and wash hair. If shower facilities are not available at the work site, shower immediately at home and wash hair

VI. Housekeeping - Paragraph (H)

Your employer must establish a housekeeping process sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is generally prohibited unless removal with compressed air is done in conjunction with ventilation systems designed to contain dispersal of the lead dust. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used equipped with a special filter called a high-efficiency particulate air (HEPA) filter and emptied in a manner which minimizes the re-entry of lead into the workplace.

VII. Hygiene Facilities and Practices - Paragraph (I)

- A. The standard requires that hand washing facilities are provided where occupational exposure to lead occurs. In addition, change areas, showers (where feasible), and lunchrooms or eating areas are to be made available to workers exposed to lead above the PEL. Your employer must assure that except in these facilities, food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, where airborne exposures are above the PEL. Change rooms provided by your employer must be equipped with separate storage facilities for your protective clothing and equipment and street clothes to avoid cross-contamination. After showering, no required protective clothing or equipment worn during the shift may be worn home. It is important that contaminated clothing or equipment be removed in change areas and not be worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc.
- B. Lunchrooms or eating areas may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.
- C. All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

VIII. Medical surveillance - Paragraph (J)

- A. The medical surveillance process is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have effectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers (1) who have high body burdens of lead acquired over past years, (2) who have additional uncontrolled sources of non-occupational lead exposure, (3) who exhibit unusual variations in lead absorption rates, or (4) who have specific non-work related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia). In addition, control systems may fail, or hygiene and respirator processes may be inadequate. Periodic medical surveillance of individual workers will help detect those failures.
- B. Medical surveillance will also be important to protect your reproductive ability regardless of whether you are a man or woman. All medical surveillance required by the interim final standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance process has two parts – periodic biological monitoring and medical examinations. Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring process.
- C. Full medical surveillance must be made available to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 ug/dl. Initial medical surveillance consisting of blood sampling and

analysis for lead and zinc protoporphyrin must be provided to all employees exposed at any time (1 day) above the action level.

- D. Biological monitoring under the standard must be provided at least every 2 months for the first 6 months and every 6 months thereafter until your blood lead level is below 40 ug/dl. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an adverse metabolic effect of lead on your body and is therefore an indicator of lead toxicity. If your BLL exceeds 40 ug/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not to be reduced until 2 consecutive BLLs indicate a blood lead level below 40 ug/dl. Each time your BLL is determined to be over 40 ug/dl, your employer must notify you of this in writing within 5 working days of his or her receipt of the test results.
- E. The employer must also inform you that the standard requires temporary medical removal with economic protection when your BLL exceeds 50 ug/dl. (See Discussion of Medical Removal Protection - Paragraph (k).) Anytime your BLL exceeds 50 ug/dl your employer must make available to you within 2 weeks of receipt of these test results a second follow-up BLL test to confirm your BLL. If the 2 tests both exceed 50 ug/dl, and you are temporarily removed, then your employer must make successive BLL tests available to you on a monthly basis during the period of your removal. Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 ug/dl at anytime during the preceding year and you are being exposed above the airborne action level of 30 ug/m(3) for 30 or more days per year.
- F. The initial examination will provide information to establish a baseline to which subsequent data can be compared. An initial medical examination to consist of blood sampling and analysis for lead and zinc protoporphyrin must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level at any time. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test.
- G. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child. Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See Part IX, below.) The standard specifies the minimum content of pre- assignment and annual medical examinations.
- H. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Pre-assignment and annual medical examinations must include (1) a detailed work history and medical history; (2) a thorough physical examination, including an evaluation of your pulmonary status if you will be required to use a respirator; (3) a blood pressure measurement; and (4) a series of laboratory tests designed to check your blood chemistry and your kidney function. In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

- I. The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which will give you a chance to have a physician of your choice directly participate in the medical surveillance process. If you are dissatisfied with an examination by a physician chosen by your employer, you can select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute.
- J. Generally your employer will choose the physician who conducts medical surveillance under the lead standard - unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.
- K. The standard requires your employer to provide certain information to a physician to aid in his or her examination of you. This information includes (1) the standard and its appendices, (2) a description of your duties as they relate to occupational lead exposure, (3) your exposure level or anticipated exposure level, (4) a description of any personal protective equipment you wear, (5) prior blood lead level results, and (6) prior written medical opinions concerning you that the employer has. After a medical examination or consultation the physician must prepare a written report which must contain (1) the physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead, (2) any recommended special protective measures to be provided to you, (3) any blood lead level determinations, and (4) any recommended limitation on your use of respirators. This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator. The medical surveillance process of the interim lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including workers' compensation laws, which disallow a worker who learns of a job - related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that OSHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance process can significantly affect the legal remedies of a worker who has acquired a job - related disease or impairment, it is proper for OSHA to make you aware of this.
- L. The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most

widely used chelating agents are calcium disodium EDTA, (Ca Na₂ EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

- M. The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be "safe". It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation.
- N. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting. The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involves giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning. In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

IX. Medical Removal Protection - Paragraph (K)

- A. Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits.
- B. The purpose of this process is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. For up to 18 months, or for as long as the job the employee was removed from lasts, protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this 18 month period expires.
- C. You may also be removed from exposure even if your blood lead level is below 50 ug/dl if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical process makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so. The standard does not give specific instructions dealing with what an employer must do with a removed worker.
- D. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is

made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard. In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible. In all of these situations, MRP benefits must be provided during the period of removal - i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings include more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow up medical surveillance; you may lose your eligibility for MRP benefits.

- E. When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them. If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.
- F. The standard also covers situations in which an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

X. Employee Information and Training - Paragraph (L)

Your employer is required to provide an information and training process for all employees exposed to lead above the action level, or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The process must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level. This training process must also be provided at least annually thereafter, unless further exposure above the action level will not occur.

XI. Signs - Paragraph (M)

- A. The standard requires that the following warning sign be posted in work areas where the exposure to lead exceeds the PEL:

$\frac{3}{4}$ WARNING

$\frac{3}{4}$ LEAD WORK AREA

$\frac{3}{4}$ POISON

$\frac{3}{4}$ NO SMOKING OR EATING

- B. These signs are to be posted and maintained in a manner which assures that the legend is readily visible.

XII. Recordkeeping - Paragraph (N)

- A. Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytical techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Such records are to be retained for at least 30 years.
- B. Your employer is also required to keep all records of biological monitoring and medical examination results. These records must include the names of the employees, the physician's written opinion, and a copy of the results of the examination. Medical records must be preserved and maintained for the duration of employment plus 30 years. However, if the employee's duration of employment is less than 1 year, the employer need not retain that employee's medical records beyond the period of employment if they are provided to the employee upon termination of employment. Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection process. This record must include your name and Social Security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.
- C. The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than BLL's must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

XIII. Observation of Monitoring - Paragraph (O)

When air monitoring for lead is performed at your project as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective

devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

XIV. For Additional Information

- A. A copy of the interim standard for lead in construction can be obtained free of charge by calling or writing the OSHA Office of Publications, room N-3101, United States Department of Labor, Washington, D.C. 20210: Telephone (202) 219-4667.
- B. Additional information about the standard, its enforcement, and your employer's compliance can be obtained from the nearest OSHA Area Office listed in your telephone directory under United States Government/Department of Labor.

LIFTING AND CARRYING

1. PURPOSE

This policy is intended as a guide for the safe lifting and carrying of materials and equipment.

2. SCOPE

This policy applies to projects where lifting and carrying is required by:

- A. NextSun Energy, LLC (NSE)
- B. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management
- C. All NextSun Energy, LLC, contractors, sub contractors, and their workers, while working under NextSun Energy, LLC contracts

3. LIFTING AND CARRYING

A. When Lifting Heavy Objects:

- i. Get help
- ii. When two or more persons carry a heavy object that is to be lowered or placed, have a prearranged signal to release the load

B. Correct way to lift:

- i. Size up the load
- ii. Keep your feet apart and firmly planted
- iii. Bend your knees
- iv. Keep your back straight
- v. Take a firm grip
- vi. Lift by gradually straightening your legs
- vii. Keep the load close to your body

NEXTSUN ENERGY, LLC

LOTO Process

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NEXTSUN ENERGY, LLC

Control of Hazardous Energy Lockout & Tagout

1. PURPOSE & SCOPE

- a. This process and process for NextSun Energy, LLC (NSE) covers the servicing and maintenance of pipelines and pipeline components, machines, powered tools and equipment used in the workplace where the unexpected energization or release of product, start up of the machines, equipment or system, or release of stored energy, could cause injury to employees. This process establishes minimum performance requirements for the control of such hazardous energy.
- b. This process and process apply to the control of energy during installation, servicing, repair and/or maintenance operations. Normal production operations are not covered by this process.
- c. Servicing and/or maintenance which takes place during normal production operations is covered by this standard only if:
 - $\frac{3}{4}$ An employee is required to remove or bypass a guard or other safety device; or
 - $\frac{3}{4}$ An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.
 - $\frac{3}{4}$ Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection.
- d. This process and process does not apply to work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- e. This process and process does not apply to hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that:
 - $\frac{3}{4}$ continuity of service is essential

- ¾ shutdown of the system is impractical; and
- ¾ documented safe work procedures are followed, and special equipment is used which will provide proven effective protection for employees
- f. Under this process and process, NSE shall establish and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start up or release of stored energy in order to prevent injury to employees.
- g. When other operations and specific safe work procedures require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this process and the procedures set forth herein.
- h. Written NSE *Lockout and Tagout (LOTO) Procedures* shall be referenced when following machine-specific, circuit specific and system-specific methods for isolating and controlling hazardous energy.

2. **REFERENCE**

29 CFR 1910.147

3. **GENERAL REQUIREMENTS**

a. Energy Control Process

The energy control process established here consists of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, startup or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative.

b. Lockout/tagout

- ¾ Lockout and tagout shall only be performed by authorized persons as defined in this process and process. Persons who are exposed to incidents and injury in their work by the accidental energizing of the machine, circuit or system on which they are working shall be trained and authorized to perform lockout and tagout. This includes supervisors, welders, and each individual who is exposed to the hazard.
- ¾ If an energy isolating device is not capable of being locked out, the employee authorized to perform lockout and tagout shall utilize a tagout system, but only with specific permission of the on-site supervisor and NSE Safety Director. In all other circumstances lockout and tagout shall be utilized to control and isolate hazardous energy sources.

- ³/₄ Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, NSE management shall confirm that energy isolating devices for such machines or equipment are designed to accept a lockout device.
- c. Special permissions and full employee protection required for “tagout only”
- ³/₄ Specific permissions of the on-site supervisor and the NSE Safety Director are required when a lock cannot be placed and “tagout only” is considered. When such permissions have been obtained and a tagout device is used on an energy isolating device that is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached. The standard that shall be met in all authorized “tagout only” situations is that the NSE shall demonstrate that the tagout process alone will provide a level of safety equivalent to that obtained by using a lockout process.
- ³/₄ In demonstrating that a level of safety is achieved in the tagout process which is equivalent to the level of safety obtained by using a lockout process, the safety standard that shall be met is full compliance with all tagout-related provisions together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as:
- the removal of an isolating circuit element
 - blocking of a controlling switch
 - opening of an extra disconnecting device
 - or the removal of a valve handle to reduce the likelihood of inadvertent energization
- d. Energy control procedure
- ³/₄ Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this process and process based on job-specific and site-specific work situations.
- ³/₄ NSE need not document the required procedure for a particular machine or equipment, when all of the following elements exist:
- the machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees
 - the machine or equipment has a single energy source which can be readily identified and isolated

- the isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment
 - the machine or equipment is isolated from that energy source and locked out during servicing or maintenance
 - a single lockout device will achieve a locked-out condition
 - the lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance
 - the servicing or maintenance does not create hazards for other employees; and
 - in utilizing this exception, NSE has had no incidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.
- e. The machine-specific or system-specific procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:
- $\frac{3}{4}$ A specific statement of the intended use of the procedure
 - $\frac{3}{4}$ Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy
 - $\frac{3}{4}$ Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and
 - $\frac{3}{4}$ Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.
- f. Protective materials and hardware
- $\frac{3}{4}$ Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by NSE for isolating, securing or blocking of machines or equipment from energy sources.



³/₄ Lockout devices and tagout devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

- Durability

- ◆ Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
- ◆ Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.
- ◆ Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.



- Standardized devices

Lockout and tagout devices shall be standardized within the facility or workplace in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.

- Substantial design and construction

- ◆ Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.
- ◆ Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a 1-piece, all environment-tolerant nylon cable tie.

- Identifiable

Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

³/₄ Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: ***Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate.***

g. Periodic inspection

- $\frac{3}{4}$ The Safety Director shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and OSHA requirements are being followed.
- $\frac{3}{4}$ The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.
- $\frac{3}{4}$ The periodic inspection shall be conducted to correct any deviations or inadequacies identified.
- $\frac{3}{4}$ Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.
- $\frac{3}{4}$ Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth in paragraph (c)(7)(ii) of this section.
- $\frac{3}{4}$ NSE shall certify in writing that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

h. Training and communication

- $\frac{3}{4}$ NSE shall provide training to ensure that the purpose and function of the energy control process are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:
 - Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
 - Each affected employee shall be instructed in the purpose and use of the energy control procedure.
 - All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked out or tagged out.
- $\frac{3}{4}$ When tagout systems are used, employees shall also be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
- When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control process.
- Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

³/₄ Employee retraining

- Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.
 - Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever NSE has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.
 - The retraining shall re-establish employee proficiency and introduce new or revised control methods and procedures, as necessary.
 - NSE shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.
- i. Energy isolation, lockout and/or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.
 - j. Affected employees shall be notified by NSE on-site or division supervisor or authorized employee of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

4. APPLICATION OF CONTROL

The established procedures for the application of energy control (the lockout or tagout procedures) shall cover the following elements and actions and shall be done in the following sequence:

- a. *Preparation for shutdown.* Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.
- b. *Machine or equipment shutdown.* The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.
- c. *Machine or equipment isolation.* All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).
- d. *Lockout or tagout device application.*
 - $\frac{3}{4}$ Lockout or tagout devices shall be affixed on each energy isolating device by authorized employees.
 - $\frac{3}{4}$ Lockout devices, where used, shall be affixed in a manner to that will hold the energy isolating devices in a "safe" or "off" position.
 - $\frac{3}{4}$ Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.
 - Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.
 - Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.
 - $\frac{3}{4}$ Stored energy
 - Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

- If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.
- ¾ Verification of isolation. Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished.
- e. *Release from lockout or tagout.* Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:
- ¾ The machine or equipment. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.
- ¾ Employees.
- The work area shall be checked to ensure that all employees have been safely positioned or removed.
 - After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.
- ¾ Lockout or tagout devices removal.
- Each lockout or tagout device shall be removed from the energy isolating device by the employee who applied the device.
 - When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the On-site Supervisor or Division Supervisor in accordance with NSE's specific written procedures, and when the supervisor has been trained for such removal in accordance with NSE's written lockout and tagout procedures. The safety standard to be met is that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:
 - ◆ Verification by NSE that the authorized employee who applied the device is not at the facility;
 - ◆ Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and
 - ◆ Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

f. *Additional requirements.*

$\frac{3}{4}$ Testing or positioning of machines, equipment or components thereof. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:

- Clear the machine or equipment of tools and materials in accordance with procedures specified in this process and process;
- Remove employees from the machine or equipment area in accordance with procedures specified in this process and process;
- Remove the lockout or tagout devices in accordance with procedures specified in this process and process;
- Energize and proceed with testing or positioning;
- De-energize all systems and reapply energy control measures in accordance with procedures specified in this process and process to continue the servicing and/or maintenance.

$\frac{3}{4}$ Outside personnel (contractors, etc.)

- Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, NSE and the outside contractor shall inform each other of their respective lockout or tagout procedures.
- NSE on-site supervisor shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside contractor's energy control process.

$\frac{3}{4}$ Group lockout or tagout

- When servicing and/or maintenance is performed by a crew, craft, division or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.
- Group lockout or tagout devices shall be used in accordance with the procedures required by machine, circuit or system specific lockout and tagout procedures, but not necessarily limited to, the following specific requirements:
 - ◆ Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock)

- ◆ Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment and
 - ◆ When more than 1 crew, craft, division, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and
 - ◆ Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.
- g. *Shift or personnel changes.* Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

5. **SPECIFIC PROCEDURES**

- a. Individual LOTO. Compare NSE LOTO procedures with host employer LOTO procedures in place or being utilized at the job site. Proper LOTO procedures require the following steps:
- $\frac{3}{4}$ Complete NSE's or host employer's work permit or Job Safety Analysis (JSA), as applicable to the work and situation and in accordance with NSE procedures
 - $\frac{3}{4}$ Notify all affected personnel and host employer personnel in the immediate or affected area that LOTO will be utilized and why
 - $\frac{3}{4}$ Identify all energy sources and isolation devices
 - $\frac{3}{4}$ As allowed and authorized by the host employer, shut down the equipment by following normal shutdown procedures in accordance with host employer requirements. The host employer may require shutdown by host employer personnel only
 - $\frac{3}{4}$ Isolate the equipment from all potential energy sources
 - $\frac{3}{4}$ Lockout and tagout energy isolation devices in accordance with NSE safety procedures, or confirm any such LOTO by host employer personnel. Complete the required LOTO information on the work permit form or JSA in accordance with form completion procedures

- ¾ Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, air, gas, capacitors, steam, or water pressure) must be dissipated or restrained by appropriate methods (such as repositioning, blocking, bleeding down)
 - ¾ Visually inspect equipment isolation and de-energization by attempting to start or otherwise operate the device. This is done to ensure that the LOTO was effective
 - ¾ Perform the repair or maintenance
 - ¾ Inspect the area around the machines or equipment to ensure that no one is exposed; then remove any tools or rags, and replace any guards or covers
 - ¾ Notify all affected personnel in the area that energy will be restored
 - ¾ Remove all LOTO devices
 - ¾ Operate the energy-isolating devices to restore energy to the machine or equipment
 - ¾ Return the equipment to normal service
 - ¾ Advise all affected personnel that operations are back to normal
 - ¾ Complete and terminate the work permit or JSA form
- b. Extended-Time Energy Isolation Work. When equipment or machines have been locked out for longer than 24 hours, the individual performing the work shall confirm the following:
- ¾ Appropriate locks and tags remain in place
 - ¾ The tag is still serviceable, effective in its communication, and appropriate to the situation
- c. Shift Changes and Call-Out Situations. During changes of shifts and when there is a call-out, any LOTO in place must carry over and be maintained as effective protection. The procedures explained below shall be followed regarding shift changes and call-outs:
- ¾ Employees coming to work on a shift or called out to a work assignment shall identify any equipment, machines or systems pertinent to the work that is locked out.
 - ¾ Employees shall inspect and become thoroughly familiar with the LOTO procedures in place and how they are protecting personnel at the time of the shift change or call-out.
 - ¾ When the authorized person who installed the LOTO will not be the same person who completes and removes the LOTO, the personnel coming onto the shift or responding to the call-out shall place their own lock(s) and tag(s) either before or during the process of removal of the lock(s) and tag(s) of the authorized person being relieved.

d. Procedure Involving More Than One Person

- $\frac{3}{4}$ When more than one person is performing work on equipment, machines or systems that require LOTO, each individual performing this work must place his or her own lock(s) or tag(s) in a manner that effectively isolates energy sources.
- $\frac{3}{4}$ If an energy-isolating device accepts only a single lock or tag, a LOTO hasp device that accepts multiple locks and tags shall be used to secure the single-lock energy isolating device.
- $\frac{3}{4}$ If locked box or locked cabinet procedures is chosen for performing LOTO, confirm that a single lock is placed on the energy-isolating device and the key to that single lock is secured in the locked box or locked cabinet. In turn, the locked box or cabinet is then secured by a lock placed by each employee performing the work. In this way each member of the group is protected by his or her own lock and key because it secures the key to the lock on the energy-isolating device.
- $\frac{3}{4}$ As each member of the group completes his or her work and no longer need LOTO protection, that individual shall remove his or her lock from the box or cabinet containing the key to the lock on the energy-isolating device.

e. Testing or Positioning.

- $\frac{3}{4}$ A supervisor in charge of work must authorize any removal of a LOTO device prior to any testing or positioning of machines, equipment or components, this must be approved by supervision.
- $\frac{3}{4}$ The authorized person who placed the LOTO must clear the machine or equipment and make sure that potentially exposed personnel are at a safe location before any LOTO device is removed.
- $\frac{3}{4}$ LOTO device(s) shall be removed only for the time necessary to conduct the test or positioning.
- $\frac{3}{4}$ As soon as testing or positioning is completed, the equipment, machine or system shall be de-energized in accordance with LOTO procedures and LOTO shall be re-applied. At that point attempt shall be made to start the equipment, machine or system as a test to confirm that the replaced LOTO is effective.

f. When Work and Required LOTO Carry Over to Another Shift. Sometimes specific work or maintenance will carry over to the next shift. In this situation the locked box procedure for LOTO may be used to protect personnel. This procedure involves:

- $\frac{3}{4}$ The authorized person(s) place one lock and tag on an energy isolation device. Note that more than one energy-isolating device may be involved.

- ¾ All keys to locks placed on energy-isolating devices are then secured inside of a locked box.
 - ¾ The locked box is secured with a hasp that accepts multiple locks.
 - ¾ Once an authorized person involved in the work confirms that all potentially hazardous energy sources are effectively isolated, locked out and tagged out, the authorized person places his or her own lock and tag on the locked box. This is an acceptable alternative to having each authorized person place a lock and tag on each locked-out energy-isolating device.
 - g. Removal of Another Authorized Person's LOTO. In the event that an authorized person leaves the work location without removing a LOTO he or she has placed there, NSE has established specific safety procedures that shall be followed prior to and when removing the lock or tag. Note that the host employer may have its own procedures regarding removal of another person's LOTO. These should be reviewed and coordinated with NSE procedures. NSE procedures are explained below:
 - ¾ Make a determined effort to notify the authorized person who placed the LOTO so that they can return to the work location and personally remove the lock and tag.
 - ¾ In the event that the authorized person who placed the LOTO cannot be contacted or is not able to come to the work location, NSE Site Supervisor or other authorized personnel shall confirm that it is safe to remove the lock and that the lock is removed, and all energy-isolating devices are returned to normal operating position.
 - ¾ The Site Supervisor shall notify the authorized person who initially placed the LOTO about the removal immediately upon that individual's returning to work.
 - h. Group LOTO -- Responsibilities and Requirements.
 - ¾ The following safe work procedures for performing a Group Lockout and Tagout have been established by NSE. These procedures shall be followed in coordination with group LOTO procedures of the host employer.
 - ¾ Procedures are designed to make sure all employees and personnel involved are identified, and that the level of LOTO protection provided to the group is equivalent to that provided by an individually placed LOTO.
 - ¾ When a LOTO involves more than one energy-isolating device, or when multiple personnel are involved, it may be appropriate to use separate group lockouts and tagouts.
 - ¾ For example, it may not be practical to require each authorized person to LOTO at multiple energy-isolating devices if not practical. At the same time, each employee shall comply with LOTO procedures and achieve effective protection from potentially hazardous energy sources.

- ³/₄ The group LOTO procedure provides an option for compliance with safe work requirements while not requiring an authorized person to place more than a single LOTO.
- ³/₄ NSE's Site Supervisor and the host employer's field supervisor shall make the decision when to perform a group LOTO rather than LOTOs placed by individual authorized persons.
- ³/₄ Group LOTO requires that a single authorized person be designated as the individual with overall and primary responsibility for coordinating the group LOTO. This designated authorized person shall be in charge of the LOTO and be responsible for ensuring that LOTO sequences are effectively completed. This includes performing the basic procedures and confirming that all procedures for group LOTO are followed.
- ³/₄ Procedures for group LOTO are:
- Complete the appropriate NSE and/or host employer work permit.
 - Designate the authorized person who will be in charge of and responsible for the group LOTO.
 - Complete a thorough assessment of the machines, equipment, systems and processes involved to determine all potential sources of hazardous energy. This includes identification and understanding all potential sources of residual or stored energy. This step may include discussions with other work groups, workers who have previously performed similar work, and host employer representatives who are familiar with this type of work operation and the effective control of hazardous energy.
 - Confirm that the host employer has been notified in accordance with established procedures.
 - Shutdown, or confirm shutdown, of equipment, machines, systems or processes involved with the work assignment. This may involve having the host employer designate the components involved are ready for servicing, repair or maintenance.
 - Safe-for-work designation by the host employer may involve cleaning, flushing or otherwise making sure that work assignment components are in fact safe and ready for work to begin. In situations when the host employer does not make this designation, host employer personnel should specify how the equipment, machine, system or process should be rendered safe.
 - The authorized person in charge of the group LOTO must identify, locate, and isolate all energy sources associated with the job. If needed, they must also identify, locate, and prepare relief devices for ensuring that residual or accumulated energy creates no employee hazard.

- The authorized person in charge of the group LOTO places the appropriate LOTO devices and tags on energy-isolating devices and then tests the devices to confirm that energy has been effectively isolated and cannot re-accumulate, re-charge or build up pressure. In certain situations the host employer's personnel may also apply LOTO devices in addition to those places by the authorized person in charge.
- The authorized person in charge of the group LOTO shall record LOTO information on the work permit in accordance with form procedures.
- All keys to lockout devices must be placed in a group lockout box (or a similar securing device). This box then shall be locked by the authorized person in charge of the group LOTO. The group LOTO box shall be located in a secure place known to all authorized persons involved with the work.
- Each authorized person and host employer personnel involved in the group LOTO shall place his or her individual locks and tags to the group LOTO box prior to beginning the work at hand.
- NSE employees involved in the group LOTO should:
 - ◆ Follow and respect the LOTO process.
 - ◆ Check and, as applicable, test specific LOTO device locations to confirm that proper and effective LOTO is in place.
 - ◆ The authorized person in charge of the group LOTO, or someone this person may designate, shall direct and accompany the other authorized persons to the specific locations where energy isolation is in place.
- During shift changes and the arrival of new crews, the group LOTO box shall remain locked until the authorized person in charge of the group LOTO determines that it is safe to remove the keys. This means that the lock placed by the authorized person in charge of the group LOTO usually stays on the group LOTO box until the job is completed. Other control procedures approved by the authorized person in charge of the group LOTO may be used as required as long as personnel are properly protected.
- When work is finished, the authorized person in charge of the group LOTO and, if applicable, a host employer representative inspects and reviews the completed work to confirm that it is safe to remove LOTO devices. Special precautions shall be taken to ensure that all personnel are relocated away from danger if removal of a LOTO device might present a hazard.
- The authorized person in charge of the group LOTO shall review all forms and permits filled out during the work to ensure that the assignment is properly and

safely completed. When this is accomplished, the authorized person in charge of the group LOTO is ready to remove LOTO devices from the lockout box and all other energy isolation devices.

- All applicable work permits and forms shall be completed, signed and submitted in accordance with NSE and host employer requirements.
- Personnel and supervisors shall acknowledge that each group LOTO is different and requires individual site-specific consideration and special procedures / precautions as appropriate to situations at hand. This may include procedures and precautions that are not included in the procedures explained above. Consequently, the authorized person in charge of a group LOTO has the authority to do whatever is necessary to achieve safety for all NSE employees and personnel in the work area.

³/₄ Periodic Assessment and Challenge of LOTO Procedures. NSE shall inspect, evaluate and challenge LOTO procedures for energy control at least once each year. This process is intended and shall be carried out to ensure that LOTO procedures are correct, effective and in accordance with OSHA standards and requirements. Additionally, the process shall identify and address any inadequacies or needs for updating that may be discovered.

APPENDIX 1

DEFINITIONS

1. *Affected employee.* An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.
2. *Authorized employee.* A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this process. NSE requirements for an authorized employee include training in NSE's system and specific procedures for performing and removing a lockout and tagout; participation in a group lockout and tagout; and additional training as may be required to be equivalent to the host employer's LOTO and work permit procedures (when applicable).
3. *Capable of being locked out.* An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.
4. *Energized.* Connected to an energy source or containing residual or stored energy.
5. *Energy isolating device.* A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:
 - $\frac{3}{4}$ A manually operated electrical circuit breaker; a disconnect switch
 - $\frac{3}{4}$ A manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently
 - $\frac{3}{4}$ A line valve
 - $\frac{3}{4}$ A block
 - $\frac{3}{4}$ And any similar device used to block or isolate energy. ***IMPORTANT NOTE: Push buttons, selector switches and other control circuit type devices are not energy isolating devices***
6. *Energy source.* Any source of electrical (direct or stored), mechanical, hydraulic, pneumatic, chemical, thermal, kinetic, springs or devices under tension, gravity or other energy.
7. *Hot tap.* A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. Hot tapping is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

8. *Lockout.* The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
9. *Lockout device.* A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.
10. *Normal production operations.* The utilization of a machine or equipment to perform its intended production function.
11. *Servicing and/or maintenance.* Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.
12. *Setting up.* Any work performed to prepare a machine or equipment to perform its normal production operation.
13. *Tagout.* The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
14. *Tagout device.* A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

NEXTSUN ENERGY, LLC
Mobile Crane & Hoist Process

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NEXTSUN ENERGY, INC Mobile Cranes & Hoist Safety

1. PURPOSE

This process is intended to provide NextSun Energy, LLC (NSE) personnel with a guideline for the safe operation, use and inspection of mobile cranes and hoists.

2. SCOPE

This process applies to wheel mounted cranes of both truck and self-propelled wheel type, and any variations thereof that retain the same fundamental characteristics used by:

- v. NextSun Energy, LLC (NSE)
- w. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- x. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. REFERENCES

- a. 29 CFR 1910.180
- b. 29 CFR 1926.251
- c. 29 CFR 1926.550

4. SAFETY & OPERATIONAL REQUIREMENTS

- a. The Site Supervisor or his/her designate is responsible for assuring that:
 - ¾ Employees know, understand, and comply with the requirements of this process.
 - ¾ Employees are trained in the procedures and use of equipment they are to use to complete the job.
 - ¾ Audit and inspect for compliance of this process.
 - ¾ Each crane is on a regular (daily, monthly, annual) inspection schedule.
 - ¾ Proofs of regular inspections using the checklist in this process are available.
 - ¾ Rental or leased cranes have a valid annual certification sticker or other documents prior to the use of the cranes.

- ¾ Competent, qualified operators are used when lifting.
- ¾ A *Crane Safe Work Permit* is issued for the following:
 - All lifts with cranes having a capacity greater than 10 tons.
 - All critical lifts.
- ¾ Joint responsibility with the crane operator for the safe operation of the crane(s) and the safety of the lift is maintained.
- ¾ Failure to comply with this process will result in disciplinary action, up to and including discharge.

b. The crane operator is responsible for:

- ¾ Knowing, understanding, and complying with this process.
- ¾ Inspecting cranes on a daily basis and reporting defects noted during these inspections.
- ¾ Reporting any unsafe conditions to supervision.
- ¾ Knowing the weight of loads PRIOR to lifting.
- ¾ Knowing the wind speed PRIOR to lifting.
- ¾ Performing a daily inspection using the *Daily Operators Inspection Report* at the beginning of each days work PRIOR to the crane use. Any deficiencies that affect the safe operations of the crane shall be repaired PRIOR to use. Each daily inspection report shall remain with the operator during the operation of the crane and turned in at the end of the work day.
- ¾ Perform a lifting job specific pre-task assessment using *Operators Lift Pre-Task Safety Assessment* for each lift.
- ¾ Insure the load, rigging, procedures, and lifts are safe to use. The operator is responsible for the load and lift when the crane is connected to the load.
- ¾ Assume joint responsibility with the Site Supervisor for the safe operation of the crane(s) and the safety of the lift.
- ¾ Understand that failure to comply with this process will result in disciplinary action, up to and including discharge.

5. GENERAL REQUIREMENTS

a. Pre-Lift

- ¾ Manufacturer's lifting procedures and methods shall be observed at all times.

- ³/₄ No modifications or additions which affect the capacity or safe operation of the equipment shall be made by NextSun Energy, LLC without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.
- ³/₄ All cranes shall have a qualified competent operator.
- ³/₄ Inspect cranes when they arrive on site for mechanical integrity, load chart, operating manual, and annual certification decal/sticker. (See process on Rigging)
- ³/₄ The crane operator must complete an *Operator's Lift Pre-Task Assessment* and *Mobile Hoisting Safe Work Procedure* PRIOR to lifting.
- ³/₄ Rated load capacities, recommended operating speeds, special hazard warnings, or instructions shall be in a conspicuous place on all equipment, as required, and shall be visible to the operator while at the control station.
- ³/₄ Inspect all rigging devices before use. Follow manufacturer's capacities and recommendations.
- ³/₄ Obtain a *Crane Safe Work Permit* for all cranes with capacities of 10 tons or more and critical lifts.
- ³/₄ Work with lifts, cranes, or any hoisting equipment must be supervised at all times.
- ³/₄ A qualified Signal Person must be provided.
- ³/₄ Wooden pads on outriggers will be used on all non-concrete surfaces. Mats will be used as needed.
- ³/₄ The rear of the rotating superstructure of a crane will be barricaded to warn of the pinch point hazard.
- ³/₄ The area where an overhead lift is made will be barricaded if personnel can have access and walk under the load.
- ³/₄ Load block, headache ball, hooks, boom tip, and anti-2 block devices shall be marked with highly visible fluorescent orange paint.
- ³/₄ All jibs shall have positive stops to prevent their movement of more than 5 degrees above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this rule.

b. Lifting

- ³/₄ Lifting multiple loads, "Christmas treeing", is prohibited.
- ³/₄ Hand signals to crane operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site.
- ³/₄ All employees shall be kept clear of loads about to be lifted and of suspended loads.
- ³/₄ There shall be no sudden acceleration or deceleration of the moving load.
- ³/₄ Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.
- ³/₄ No hoisting, lowering, swinging, or traveling shall be done while anyone is on the load or hook.
- ³/₄ On truck-mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.
- ³/₄ The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.
- ³/₄ Outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane. Where floats are used they shall be securely attached to the outriggers.
- ³/₄ Wood blocks used to support outriggers shall:
 - Be strong enough to prevent crushing.
 - Be free from defects.
 - Be of sufficient width and length to prevent shifting or toppling under load.
- ³/₄ Neither the load nor the boom shall be lowered below the point where less than 2 full wraps of rope remain on their respective drums.
- ³/₄ When two or more cranes are used to lift one load, one designated person shall be responsible for the operation. He/she shall be required to analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.
- ³/₄ In transit the following additional precautions shall be exercised:

- The boom shall be carried in line with the direction of motion.
 - The superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab or the boom is supported on a dolly.
 - The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.
- ³/₄ Before traveling a crane with load, a designated person shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with his determinations.
 - ³/₄ A crane with or without load shall not be traveled with the boom so high that it may bounce back over the cab.
 - ³/₄ When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radii at which it can be controlled. A tag or restraint line shall be used when rotation of the load is hazardous.
 - ³/₄ When a crane is to be operated at a fixed radius, the boom-hoist pawl or other positive locking device shall be engaged.
 - ³/₄ Ropes shall not be handled on a winch head without the knowledge of the operator.
 - ³/₄ While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.
 - ³/₄ The operator shall not be permitted to leave his position at the controls while the load is suspended.
 - ³/₄ No person should be permitted to stand or pass under a load on the hook.
 - ³/₄ If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means of the operator's station.

c. Other Requirements

- ³/₄ Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the maker, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without full ballast or counterweight in place. The ballast or counterweight in place specified by the manufacturer shall not be exceeded.
- ³/₄ Necessary clothing and personal belongings shall be stored in such a manner as to not

interfere with access or operation.

- ³/₄ Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.
- ³/₄ Refueling with small portable containers shall be done with an approved safety type can equipped with an automatic closing cap and flame arrester.
- ³/₄ Machines shall not be refueled with the engine running.
- ³/₄ A carbon dioxide, dry-chemical, or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane.
- ³/₄ Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.

d. Crane maintenance, repairs and “out of service” procedures

Prior to making repairs or adjustments to a crane, specific procedures shall be followed and precautions taken:

- ³/₄ Move the crane to be repaired to a place where it will cause the least interference with other cranes and operations in the area.
- ³/₄ Set all controllers to the off position.
- ³/₄ Open the main or emergency switch and lock it in the open position.
- ³/₄ Place prominent warning or "out of order" signs on the crane so that they are in plain sight of workers in the area.
- ³/₄ After repairs and adjustments are completed, replace all guards, reactivate all safety devices and remove maintenance equipment before operating the crane.

6. OPERATIONS NEAR OVERHEAD ELECTRICAL LINES

Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

- a. For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.
- b. For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV. over 50 kV., or twice the length

of the line insulator, but never less than 10 feet.

- c. In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV., and 10 feet for voltages over 50 kV., up to and including 345 kV., and 16 feet for voltages up to and including 750 kV.
- d. A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
- e. Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.
- f. Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- g. Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane.
- h. The following precautions shall be taken when necessary to dissipate induced voltages:
 - $\frac{3}{4}$ The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and
 - $\frac{3}{4}$ Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.
 - $\frac{3}{4}$ Combustible and flammable materials shall be removed from the immediate area prior to operations.

7. INSPECTION REQUIREMENTS

- a. The Crane Operator and the Crane Competent Person are responsible for performing inspections using *Daily Operators Inspection Report -- Mobile Crane Operation*, *Monthly Hydraulic Crane Inspection Report* and *Monthly Inspection of Truck Cranes*.
- b. Inspection of critical components of the crane shall be performed at least monthly. Components inspected shall include crane hooks and safety latches; brakes and braking components; and ropes.
- c. Inspection records shall be filed and maintained by the Safety Director at NSE main office. Crane certification records shall include the inspection date, signature of the

inspector, and identification of the component by serial number or other identifier. This certification record shall be maintained so that it is readily available for inspection and confirmation.

- d. A written record also shall be maintained of reports showing rated load test procedures and confirming the adequacy of repairs or alterations.
 - $\frac{3}{4}$ Test loads shall not exceed 110 percent of the rated load at any selected working radius. If re-rating is required, crawler, truck, and wheel-mounted cranes shall be tested in accordance with SAE Recommended Practice, Crane Load Stability Test Code J765 (April 1961). Re-rating test report shall be readily available.
 - $\frac{3}{4}$ No re-rating in excess of a crane's original load rating shall be performed unless the manufacturer or designated technician who is in charge of final assembly gives their approval in writing. Such written approval shall be maintained in a file by the Safety Director.
- e. A thorough annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor. NextSun Energy, LLC shall maintain a record of the dates and results of inspections and rated load tests for each hoisting machine and piece of equipment.
- f. Any defects found will be repaired by a qualified person before the crane is used. Before a crane is placed in service for use, rope components shall be inspected by a qualified person for defects, damage and deformities and at least monthly thereafter. Certification of this inspection shall be in writing and document the date of inspection; inspector's name and signature; and identification number of the rope component inspected.
 - $\frac{3}{4}$ Wire rope shall be taken out of service when any of the following conditions exist:
 - $\frac{3}{4}$ In running ropes, 6 randomly distributed broken wires in 1 lay or 3 broken wires in one strand in one lay
 - $\frac{3}{4}$ Wear of $\frac{1}{3}$ the original diameter of outside individual wires
 - $\frac{3}{4}$ Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure
 - $\frac{3}{4}$ Evidence of any heat damage from any cause
 - $\frac{3}{4}$ Reductions from nominal diameter of more than $\frac{1}{64}$ inch for diameters up to and including $\frac{5}{16}$ inch, $\frac{1}{32}$ inch for diameters $\frac{3}{8}$ inch to and including $\frac{1}{2}$ inch, $\frac{3}{64}$ inch for diameters $\frac{9}{16}$ inch to and including $\frac{3}{4}$ inch, $\frac{1}{16}$ inch for diameters $\frac{7}{8}$ inch to $1 \frac{1}{8}$ inches inclusive, $\frac{3}{32}$ inch for diameters $1 \frac{1}{4}$ to $1 \frac{1}{2}$ inches inclusive
 - $\frac{3}{4}$ In standing ropes, more than 2 broken wires in 1 lay in sections beyond end connections or more than 1 broken wire at an end connection

- ³/₄ Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966
- ³/₄ Heavy wear and/or broken wires may occur in sections that have contact with equalizer sheaves or other sheaves (where rope travel is limited) or with saddles. Particular care shall be taken to inspect ropes at these locations.
- ³/₄ If rope has not been used for a month or longer (i.e. due to shutdown or storage of a crane on which it is installed) this rope shall be given a thorough inspection before it is used.
- ³/₄ This inspection shall be made by a designated person who is authorized by NSE. This inspector shall examine rope for any kind of damage, deterioration or defect that might compromise the safety and specifications of the rope. Specific attention and care shall be given to the inspection of non-rotating rope.
- ³/₄ Only this designated and authorized inspector shall give approval for use of this rope following satisfactory safety inspection as described above.
- ³/₄ A written record of the inspector's certification shall be maintained by the Safety Director in a file and be readily available for review and confirmation. This certification shall include the inspection date, name and signature of the inspector, and the identification number of the rope component that was inspected.

g. Inspection of hoist chains

- ³/₄ Hoist chains and end connections shall be inspected daily for damage, deterioration, excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.
- ³/₄ Chains shall be inspected visually by the operator each day or before first use.
- ³/₄ Chains also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the chain that was inspected. Written certification records shall be maintained by the Safety Director in a file.

h. Inspection of hooks and hook components

- ³/₄ Crane hooks and safety latches shall be visually inspected each day or at the beginning of a shift prior to use for damage, cracks or deformation.
- ³/₄ Hooks and safety latches also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the hook that was inspected. Written certification records shall be maintained by the Safety Director in a file.
- ³/₄ Hooks that have cracks or a throat opening that is greater than 15 percent in excess of

normal, or more than 10 degree twist from the plane of the unbent hook shall be discarded.

i. Preventive maintenance

NSE has implemented a preventive maintenance process to help ensure the safety of cranes, hoists, rigging and related equipment. Preventive maintenance shall be performed in accordance with manufacturer's recommendations. Each crane shall have a written record of preventive maintenance that is maintained by the Safety Director.

8. TRAINING REQUIREMENTS

- a. Training will be conducted on the requirements of this process annually, whenever this process is revised, and for new crane operators or newly hired operators.
- b. Crane operators and the rigging crew will review this process prior to lifts. If the job has multiple lifts this process will be reviewed once prior to the jobs starting. All new crane operators and rigging crew members will review this process prior to starting work.

Appendix 1

DEFINITIONS

1. *Accessory* -- A secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.
2. *Axis of Rotation* -- The vertical axis around which the crane superstructure rotates.
3. *Base* -- The traveling base or carrier on which the rotating superstructure is mounted such as a car, truck, crawlers, or wheel platform.
4. *Boom Angle* -- The angle between the horizontal and longitudinal centerline of the boom. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.
5. *Boom Hoist* -- A hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.
6. *Boom* -- Member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or A-frame and used for supporting the hoisting tackle.
7. *Boom Stop* -- A device used to limit the angle of the boom at the highest position.
8. *Brake* -- A device used for retarding or stopping motion by friction or power means.
9. *Cab* -- A housing which covers the rotating superstructure machinery and/or operator's station. On truck-crane trucks a separate cab covers the driver's station.
10. *Clutch* -- A friction, electromagnetic, hydraulic, pneumatic, or positive mechanical device for engagement or disengagement of power.
11. *Counterweight* -- A weight used to supplement the weight of the machine in providing stability for lifting working loads.
12. *Crane Safe Work Permit* -- The permit issued by the Site Supervisor or Crane Competent Person at the job site to the crane operator before any mobile hoisting work is performed.
13. *Critical Lift* -- A lift where:
 - $\frac{3}{4}$ The load exceeds 80% of the crane's capacity.
 - $\frac{3}{4}$ Weight of the lift exceeds 50% of the load chart rating of the equipment being used and the lift is over power lines, process equipment, piping, or personnel are being lifted.
 - $\frac{3}{4}$ Two booms are required.
 - $\frac{3}{4}$ Poles or derricks have been erected.
 - $\frac{3}{4}$ Personnel are being lifted.
 - $\frac{3}{4}$ Crane is traveling with load.

³/₄ Any lift in a Critical Lift Area.

14. *Designated* -- Means selected or assigned by NSE or a representative of NSE as being qualified to perform specific duties.
15. *Drum* -- Cylindrical members around which ropes are wound for raising and lowering the load or boom.
16. *Dynamic* -- Means loads introduced into the machine or its components by forces in motion for hoisting and lowering loads.
17. *Gantry* -- Structural frame, extending above the superstructure, to which the boom support ropes are reeved.
18. *Jib* -- An extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles.
19. *Load (working)* -- Means the external load, in pounds, applied to the crane, including the weight of load-attaching equipment such as load blocks, shackles, and slings.
20. *Load block [lower]* -- Means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.
21. *Load block [upper]* -- Means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.
22. *Load hoist* -- A hoist drum and rope reeving system.
23. *Load Ratings* -- Crane ratings in pounds established by the manufacturer.
24. *Locomotive Crane* -- Consists of a rotating superstructure with power-plant, operating machinery and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii.
25. *Mobile Hoisting Equipment* -- Conventional rigid boom cranes, hydraulic cranes, and flex-lifts.
26. *Outriggers* -- Extendable or fixed metal arms, attached to the mounting base, which rest on supports at the outer ends.
27. *Reeving* -- A rope system in which the rope travels around drums and sheaves.
28. *Rigging* -- Any cables, chokes, slings, hooks, beams, spreaders, or other device used to attach or lift the load.
29. *Rope* -- Refers to a wire rope unless otherwise specified.
30. *Side Loading* -- A load applied at an angle to the vertical plane of the boom.

31. *Superstructure* -- The rotating upper frame structure of the machine and the operating machinery mounted thereon.
32. *Swing* -- Means the rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.
33. *Swing Mechanism* -- The machinery involved in providing rotation of the superstructure.
34. *Tackle* -- Assembly of ropes and sheaves arranged for hoisting and pulling.
35. *Truck Crane* -- Consists of a rotating superstructure with power plant, operating machinery and boom, mounted on an automotive truck equipped with a power plant for travel. Its function is to hoist and swing loads at various radii.
36. *Wheel Mounted Crane* -- Consists of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or platform equipped with axles and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii.
37. *Whipline* -- A separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.
38. *Winch Head* -- A power driven spool for handling of loads by means of friction between fiber or wire rope and spool.

NEXTSUN ENERGY, LLC

Personal Protective Equipment Process

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NEXTSUN ENERGY, LLC

Personal Protective Equipment Process

1. **PURPOSE**

Protective equipment, including Personal Protective Equipment (PPE) for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

2. **SCOPE**

This Personal Protective Equipment process applies to:

- a. NextSun Energy, LLC (NSE)
- b. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management
- c. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts

1. **REFERENCES**

29 CFR 1910 Subpart I

4. **APPLICATION**

- a. Controlling hazards: PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices.
- b. NSE will provide employees with the proper protective equipment (PPE) for use in their specific tasks.
- c. This PPE includes, but is not limited to, eyes, face, head, respiratory system, and extremities.

- d. The PPE will be maintained and stored in accordance with the manufacturer's recommendations.

5. EMPLOYEE-OWNED EQUIPMENT

Where employees provide their own protective equipment, the Site Supervisor shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

6. DESIGN

- a. All PPE shall meet OSHA/NIOSH standards and approval.
- b. Where a standard may not apply a competent person will analyze the equipment and give approval or disapproval for its use.

7. HAZARD ASSESSMENT AND SELECTION

- a. Selection of PPE will be based on NSE supervision's written assessment of the hazards associated with the job site and the recommendations included on the safe work permit provided by the host employer or general contractor.
- b. Prior to the beginning of any job task, NSE supervision will determine the PPE necessary to safeguard the employees assigned to do the work. When the job task is complicated in nature the Site Supervisor and the host employer or general contractor safety representative will be consulted for their expertise in determining the proper PPE for the task.
- c. NSE supervision will ensure that the PPE is available and is included on the work permit. The information on the permit will be discussed with the crew assigned to do the work.
- d. When reviewing the scope of work prior to the commencement of the job, NSE supervision will assess the hazards associated with the work and its environment. This assessment will be distributed to the Site Safety Supervisor/Representative to determine the needs of the job.
- e. PPE determined for the job will be verbally communicated to the employees during a tool box safety meeting prior to the commencement of the job.
- f. The PPE selected shall be of the types that will protect the affected employee from the hazards identified in the hazard assessment, fitted to the employee as needed to be effective, and with PPE ordered in various sizes and types to accommodate a variety of individuals who may be assigned work.

8. DEFECTIVE AND DAMAGED EQUIPMENT

- a. Defective or damaged equipment shall not be used.
- b. When PPE is removed for disposal it will be tagged as such, if not disposed of immediately.

9. TRAINING

- a. NSE will provide training to each employee who is required to use PPE. Each such employee shall be trained to know at least the following:
 - $\frac{3}{4}$ When PPE is necessary
 - $\frac{3}{4}$ What PPE is necessary
 - $\frac{3}{4}$ How to properly don, doff, adjust, and wear PPE
 - $\frac{3}{4}$ The limitations of the PPE; and
 - $\frac{3}{4}$ The proper care, maintenance, useful life and disposal of the PPE
- b. Each affected employee shall demonstrate an understanding of the training specified in 6.1, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.
- c. When NSE supervision has reason to believe that any affected employee who has already been trained does not have the understanding and skill required, the employee shall be retrained. Circumstances where retraining is required include, but are not limited to, situations where:
 - $\frac{3}{4}$ Changes in the workplace render previous training obsolete; or
 - $\frac{3}{4}$ Changes in the types of PPE to be used render previous training obsolete; or inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.
- d. NSE supervision shall verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

10. EYE AND FACE PROTECTION

- a. The minimum eye protection allowed outside of an office area is ANSI (Z.87.1-1989) approved side shield safety glasses.

- b. Contact lenses are not allowed at work areas unless approved in writing by management.
- c. Supervisors and the host employer or general contractor will determine what tasks require other eye protection, such as chemical goggles and face shields.
- d. Goggles that can be worn over corrective spectacles without disturbing the adjustment are acceptable.
- e. Employees ***SHALL*** wear their eye protection to adequately protect themselves from hazards in the work area.
- f. Questions about eye protection should be brought to your supervisor and resolved before the job is started. Special protection concerns should also be discussed with your supervisor.
- g. All face and eye protection equipment shall be kept clean and in good repair.
- h. Full-face shields are required to be worn over side shield safety glasses or chemical goggles for grinding and chipping and any other designated assignment.

11. HEAD PROTECTION

- a. Approved hard hats (ANSI-Z89.1-1986) in good condition are required. Protective hardhats designed to reduce electrical shock hazard shall be worn by each affected employee when near exposed electrical conductors which could contact the head (ANSI -Z89.2-1971). Metal hard hats shall not be worn.
- b. Hard hats shall be worn in work areas where there is a potential for injury to the head from falling or flying objects.

12. HAND PROTECTION

- a. NextSun Energy, LLC will select and require employees to use appropriate hand protection when employee's hands are exposed to hazards such as those from skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.
- b. The selection of the appropriate hand protection will be based on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use and the hazards and potential hazards identified.
- c. All field employees should obtain work gloves suitable for the work they will perform. Gloves shall be worn when required.

13. FOOT PROTECTION

- a. Each affected employee shall wear protective footwear when working in areas where there is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole and where such employee's feet are exposed to electrical hazards.
- b. Protective footwear need comply with (ANSI Z41-1991). Steel-toed shoes are required on most job sites. NSE requires the wearing of steel-toed shoes for anyone in the field with the exception of office personnel who are restricted to operations off of job sites.

14. ASSESSMENT GUIDELINES

- a. Conduct a walk-through survey of the areas in question. The purpose of the survey is to identify sources of hazards to workers and co-workers. Consideration should be given to the basic hazard categories:
 - $\frac{3}{4}$ Impact
 - $\frac{3}{4}$ Penetration
 - $\frac{3}{4}$ Compression (roll-over)
 - $\frac{3}{4}$ Chemical
 - $\frac{3}{4}$ Heat
 - $\frac{3}{4}$ Harmful dust
 - $\frac{3}{4}$ Light (optical) radiation
- b. During the walk-through survey the Site Supervisor should observe:
 - $\frac{3}{4}$ Sources of motion; i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects
 - $\frac{3}{4}$ Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment, etc.
 - $\frac{3}{4}$ Types of chemical exposures
 - $\frac{3}{4}$ Sources of harmful dust
 - $\frac{3}{4}$ Sources of light radiation, i.e., welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.

- ¾ Sources of falling objects or potential for dropping objects
 - ¾ Sources of sharp objects which might pierce the feet or cut the hands
 - ¾ Sources of rolling or pinching objects which could crush the feet
 - ¾ Layout of jobsite and location of co-workers; and
 - ¾ Any electrical hazards
- c. In addition, injury/incident data should be reviewed to help identify problem areas.
 - d. Following the walk-through survey, it is necessary to organize the data and information for use in the assessment of hazards. The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment.
 - e. Having gathered and organized data on a jobsite, an estimate of the potential for injuries should be made. Each of the basic hazards should be reviewed and a determination made as to the type, level of risk, and seriousness of potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.

15. SELECTION GUIDELINES

After completion of the hazard assessment (see 11 above), the general procedure for selection of protective equipment is to:

- a. Become familiar with the potential hazards and the type of protective equipment that is available, and what it can do; i.e., splash protection, impact protection, etc.
- b. Compare the hazards associated with the environment; i.e., impact velocities, masses, projectile shape, radiation intensities, with the capabilities of the available protective equipment
- c. Select the protective equipment which ensures a level of protection greater than the minimum required to protect employees from the hazards.
- d. Fit the user with the protective device and give instructions on care and use of the PPE. It is very important that end users be made aware of all warning labels for and limitations of their PPE.

16. SELECTION CHART GUIDELINES FOR EYE AND FACE PROTECTION

The crafts and occupations associated with roofing installation, carpentry, welding and most construction activities generally require eye protection. The following chart provides general

guidance for the proper selection of eye and face protection to protect against hazards associated with the listed hazard "source" operations.

Eye and Face Protection Selection Chart

Source	Assessment of Hazard	Protection
IMPACT - Chipping, grinding machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles sand, dirt, etc.	Spectacles with side protection goggles, face shields. For severe exposure, use faceshield.
HEAT-Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks Splash from molten metals High temperature exposure	Faceshields, goggles, spectacles with side protection. For severe exposure use faceshield. Faceshields worn over goggles. Screen face shields, reflective face shields.
CHEMICALS-Acid and chemicals handling, degreasing plating.	Splash Irritating mists	Goggles, eyecup and cover types. For severe exposure, use face shield. Special-purpose goggles.
DUST - Woodworking, buffing, general dusty conditions.	Nuisance dust	Goggles, eyecup and cover types.
LIGHT and/or RADIATION - Welding: Electric arc	Optical radiation	Welding hardhats or welding shields. Typical shades: 10-14.
Welding: Gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4.
Cutting, Torch brazing, Torch soldering	Optical radiation	Spectacles or welding face-shield. shades, 1.5-3.
Glare	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable.

17. SELECTION GUIDELINE FOR HEAD PROTECTION

- a. All head protection (hardhats) is designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available which provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important.

- ¾ Class A hardhats, in addition to impact and penetration resistance, provide electrical protection from low-voltage conductors (they are proof tested to 2,200 volts).
 - ¾ Class B hardhats, in addition to impact and penetration resistance, provide electrical protection from high-voltage conductors (they are proof tested to 20,000 volts).
 - ¾ Class C hardhats provide impact and penetration resistance (they are usually made of aluminum which conducts electricity), and should not be used around electrical hazards.
- b. Where falling object hazards are present, hardhats must be worn. Some examples include: working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects to fall; and working on exposed energized conductors.

18. SELECTION GUIDELINES FOR FOOT PROTECTION

- a. Safety shoes and boots which meet the ANSI Z41-1991 Standard provide both impact and compression protection. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situations, metatarsal protection should be provided, and in other special situations electrical conductive or insulating safety shoes would be appropriate.
- b. Safety shoes or boots with impact protection would be required for carrying or handling materials such as lumber, metal construction components and parts, or heavy tools -- any of which could be dropped; and for other activities in which objects might fall onto the feet.
- c. Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as felt rolls) and around heavy pipes on a job site, all of which could potentially roll over an employee's feet.
- d. Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal, etc., could be stepped on by employees causing a foot injury.

19. SELECTION GUIDELINES FOR HAND PROTECTION

- a. Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. OSHA is unaware of any gloves that provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused.

- b. It is also important to know the performance characteristics of gloves relative to the specific hazard anticipated; e.g., chemical hazards, cut hazards, flame hazards, etc. These performance characteristics should be assessed by using standard test procedures.
- c. Before purchasing gloves, the employer should request documentation from the manufacturer that the gloves meet the appropriate test standard(s) for the hazard(s) anticipated. Other factors to be considered for glove selection in general include:
 - ³/₄ As long as the performance characteristics are acceptable, in certain circumstances, it may be more cost effective to regularly change cheaper gloves than to reuse more expensive types; and
 - ³/₄ The work activities of the employee should be studied to determine the degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stresses that will be applied
- d. With respect to selection of gloves for protection against chemical hazards:
 - ³/₄ The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effects on the skin and/or to pass through the skin and cause systemic effects
 - ³/₄ Generally, any "chemical resistant" glove can be used for dry powders
 - ³/₄ For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials; and
 - ³/₄ Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

NEXTSUN ENERGY, LLC

Process Safety Management

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NEXTSUN ENERGY, LLC

Process Safety Management

1. **PURPOSE & SCOPE**

This example Process Safety Management (PSM) Program complies with OSHA standard 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents.

As a contractor, NextSun Energy, LLC(NSE) does not establish or implement PSM Programs in the course of company operations. At the same time, the company may provide services to customers that do operate under a PSM Program and have specific requirements for contractors.

This program is included here for informational purposes only, and as a typical example of PSM development and implementation in client facilities. Actual client PSM Program requirements apply to all employees and subcontractors working within the client controlled work locations.

2. **REFERENCES**

29 CFR 1910.119

3. **CONTRACTOR SAFETY RESPONSIBILITIES UNDER A PSM PROGRAM**

The contract employer shall assure that each contract employee:

- a. Is trained in the work practices necessary to safely perform his/her job.
- b. Is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the emergency action plan.
- c. Has received and understood the training required by this paragraph. The contract employer shall prepare a record which contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training.
- d. Follows the safety rules of the facility including the safe work practices required by OSHA.
- e. Is advised of any unique hazards presented by the contract employer's work, or of any hazards found by the contract employer's work.

Example Program Follows:

PREFACE OF EXAMPLE PSM PROGRAM

Safety, health, and environmental responsibilities must be managed by line management as they manage their other responsibilities including production, quality, cost, and personnel relations. The same basic management techniques are used to manage safety, health, and environmental requirements as for production and quality management.

These include planning, organizing, leading and controlling assigned responsibilities. Responsibility for protecting people, property, and the environment begins with the ranking facility manager and extends through all levels of the line management organization including employees. Each person in the line organization from the ranking manager to the employees has specific safety, health, and environmental responsibilities that they cannot delegate to others. They must effectively discharge their personal responsibility for protecting people, property, and the environment to achieve a safe and healthful working environment.

One important part of the overall safety and health program involves the prevention of unwanted releases of hazardous chemicals into locations which could expose employees and others to serious hazards as well as the environment and people in the surrounding community.

This Process Safety Management (PSM) Program describes the management system for protecting people, property, and the environment from catastrophic releases of highly hazardous chemicals in the workplace. This is accomplished by systematically evaluating the process(es) using approaches to assess the effectiveness of the process design, technology, operations, maintenance, non-routine activities, procedures, emergency preparedness, training, and other process elements. These are described in more detail throughout this PSM program.

This PSM Program complies with OSHA standard 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents issued on February 24, 1992, and which became effective on May 26, 1992.

INTRODUCTION

The major objective of this Process Safety Management (PSM) program is to prevent unwanted releases of hazardous chemicals into locations which could expose employees and others to serious hazards including those in the surrounding community.

The PSM program involves a systematic approach to evaluating the entire process, including the design, technology, operation, maintenance, procedures, emergency plans, training programs, and other pertinent process elements. A proactive identification, evaluation and mitigation or prevention of chemical releases is utilized.

The necessary expertise, experience, judgment, and proactive initiative is provided within the line organization or obtained from outside resources as needed to assure an effective PSM program. There are continuing efforts to strengthen and improve the process safety knowledge and expertise within the line organization.

Alternative avenues of decreasing the risks associated with highly hazardous chemicals in the workplace are considered, including the reduction in the inventory of the highly hazardous chemicals and dispersing hazardous chemical storage locations where one location will not cause a release in another location.

The PSM program describes how employees are involved in the programs, how process hazard analyses are conducted, preparation of operating procedures and practices, training, contractors, pre-startup safety, mechanical integrity, managing change, incident investigation, emergency preparedness, and compliance audits.

PROCESS SAFETY MANAGEMENT SYSTEM

The facility's process safety management system is a part of the facility's safety, health, and environmental program. The Central Safety and Health Committee (CSHC), chaired by the ranking manager, serve as the decision-making and policy-setting body. All department heads reporting to the ranking manager serve on the CSHC as members and chair safety and health task groups. There are usually eight task groups including:

- Safety Activities
- Rules and Procedures
- Education and Training
- Health and Environment Inspections and Audits
- Fire and Emergency
- Accident Investigation
- Housekeeping

A brief description of the CSHC and each task group and how they are involved in the PSM program follows.

Central Safety and Health Committee

The CSHC meets monthly for about an hour to manage the overall safety, health, and environmental program. Group chairmen shall report on his or her task group reviews, audits, findings, conclusions, and recommendations at each meeting. CSHC task group meeting minutes are maintained. When recommendations are accepted, they are assigned to specific individuals for follow-up, for completion, and for resolving by specified time periods.

Task Groups

Each task group is composed of supervisory and employee members who represent their assigned departments. Usually there are an equal number of supervisors and employees on each task group. In some cases, task group members chair safety and health teams, such as one Inspections and Audits task group member chairing a Process Hazards Analysis (PHA) team. This team conducts and/or manages the PHA's.

Safety Activities

Task groups promote the overall safety, health, and environmental program to ensure that it effectively protects people, property, and the environment. Task groups help communicate the importance of the PSM program to employees and the surrounding community and solicit employee participation.

Rules and Procedures

The Rules and Procedures task group coordinates all facility safety rules and procedures to ensure that the rules and procedures are known, understood, and followed. They manage the preparation and maintenance of the rules and procedures including the PSM procedures and program information. Also, one member of the group serves on the process safety management compliance audit team.

Education and Training

This task group coordinates all facility safety, health, and environmental training programs to ensure high quality training and good comprehension. The PSM training programs are coordinated by this group, including management, supervisors, employees, and contractors.

Health and Environment

All facility health and environmental program activities are coordinated by this task group, including the hazard communication program, respiratory protection program, hearing conservation program, and bloodborne pathogens program. One member chairs an ergonomics team and another, an environmental team. The task group cooperates with the process hazards analysis team in conducting process analyses.

Inspections and Audits

This task group manages all facility safety, health, and environmental inspections, including OSHA required inspections and audits. They determine what should be inspected, when the inspections should be conducted, who should inspect, and how the inspections should be performed. One member of the task group chairs the Process Hazards Analysis (PHA) team. Details concerning the PHA team are provided following this section.

Fire and Emergency

The fire and emergency task group coordinates all facility emergency plans, including the Employee Emergency Action Plan, the Fire Prevention Plan, and emergency response. This group also manages the Emergency Preparedness requirements of the process safety management program.

Accident Investigation

All facility accident and incident investigations are managed by this task group. This group appoints a process incident investigative team. They also review all accident and incident reports, including process incident investigations.

Housekeeping

This task group coordinates all facility housekeeping activities, including routine audits. Recommendations for improving housekeeping and orderliness are made as needed.

Process Hazards Analysis (PHA) Team

The PHA team of the facility's Inspection and Audits task group conducts the required process hazard analyses per the OSHA Process Safety Management standard. The PHA team leader is a member of the Inspections and Audits task group and meets each month with the task group. When PHA team reports are completed, the team leader accompanies the Inspections and Audits task group Chairman to the CSHC meeting and presents a verbal report of the PHA findings, conclusions, and recommendations.

The PHA team leader is fully knowledgeable in the proper implementation of the PHA methodology used and is impartial in the evaluation. Other full and part-time team members provide the team with expertise in areas such as process technology, process design, operating procedures and practices, including how the work is performed, alarms, emergency procedures, instrumentation, maintenance procedures, both routine and non-routine tasks, including how tasks are authorized, procurement of parts and supplies, safety and health, and other relevant subjects as needed. One team member must be familiar with the process being analyzed.

The PHA team has an intimate knowledge of the standards, codes, specifications and regulations applicable to the process being analyzed.

See the Process Hazards Analysis section of the Process Safety Management program for more details concerning PHA methodology.

Employee Participation

Employees participate in process safety management by serving on task groups and teams. Also, employees are consulted concerning the various aspects of the process safety management program.

PROCESS SAFETY INFORMATION

A compilation of written process safety information is provided for each facility process to enable managers, supervisors, and employees to identify and understand the process hazards. This pertinent process safety information is also provided the process hazards analysis (PHA) Team. This information includes, but is not limited to:

- hazards of highly hazardous chemicals used and processed,
- process technology, and
- process equipment

Highly Hazardous Chemicals Information

Information pertaining to highly hazardous chemicals provided managers, supervisors, employees, and the PHA team includes, but not limited to:

- toxicity,
- permissible exposure limits,
- physical data,
- reactivity,
- thermal and chemical stability, and
- hazardous effects of inadvertent mixing of different materials.

Most of the above information is provided by Material Safety Data Sheets.

Process Technology Information

The process technology information provided to enable managers, supervisors, employees, and the PHA team to identify and understand the process hazards includes, but is not limited to:

- block flow diagrams or process flow diagrams,
- process chemistry, maximum intended inventory, safe upper and lower limits of temperature, pressure, flows, compositions, and
- evaluations of consequences of deviations, including those affecting employee safety and health.

In those cases where the original process technical data no longer exists, the data is developed during the initial PHA.

Process Equipment Information

Some of the process equipment information available to managers, supervision, employees, and the PHA team include, but is not limited to:

- materials of construction,
- piping and instrument diagrams,
- electrical classification,
- relief system design and design basis,
- ventilation system design, design codes and standards employed, material and energy balances for processes built after May 26, 1992, and
- safety systems (e.g., interlocks, detection or suppression systems).

Documents are maintained showing that the process equipment complies with recognized and generally accepted good engineering practices. Also, documents are provided that show existing equipment designed and constructed in accordance with codes, standards, or practices that are no longer in general use, is designed, maintained, inspected, tested, and is operating in a safe manner.

Where process technology requires a design which departs from applicable codes and standards, documents are provided which show that the design and construction is suitable for the intended purpose.

PROCESS HAZARDS ANALYSIS (PHA)

Process hazards analysis (PHA) is one of the most important elements of the process safety management (PSM) program. It is an organized and systematic effort to identify and analyze the significance of potential hazards associated with the processing or handling of highly hazardous chemicals.

The PHA provides information to assist management and employees in making decisions for improving safety and reducing the consequences of unwanted and unplanned releases of hazardous chemicals. A PHA analyzes potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals.

Each PHA focuses attention on equipment, instrumentation, utilities, human actions (routine and non-routine), external factors that might impact the process. These considerations assist in determining the hazards and potential failure points or failure modes in processes.

PHA's are conducted initially and updated at least every 5 years. Each PHA is conducted appropriately for the complexity of the process being evaluated, and to properly identify, evaluate, and control the hazards involved.

Priority

The priority for conducting PHAs is determined and documented based on the:

- extent of process hazards,
- numbers of potentially affected employees,
- age of the process, and
- operating history of the process.

Initial PHAs

All the initial PHAs are conducted as soon as possible, but not later than:

%	Completed By May 26
25	1994
50	1995
75	1996
100	1997

PHAs completed after May 26, 1987, which meet the requirements of OSHA standard 29 CFR 1910.119, were not completed again, but are updated and revalidated 5 years after the last analysis.

PHA Methodology

The PHA methodology utilized depends on many factors, including the existing process knowledge, operating experience, process changes, process size and complexity. One or more of the following methodologies may be used.

- “what-if?” method,
- checklist method,
- a combination of “what-if?” and checklist methods,
- hazard and operability study (HAZOP),
- failure mode and effects analysis (FMEA),
- fault tree analysis (FTA), or

- an appropriate equivalent methodology.

The application of a PHA to a particular process may involve the use of different methodologies for various parts of the process. For example, a process involving a series of unit operations of varying sizes, complexities, and ages may use different methodologies and PHA team members for each operation. When this is done, the PHA findings and conclusions are integrated into one final study and evaluation.

In some cases, a PHA checklist is used to perform PHA, such as for standard boiler or heat exchanger evaluations. Generic PHAs are also used for batch type processes where there are only small changes of monomer or other ingredient ratios and the chemistry is documented for the full range and ration of batch ingredients. Also, for large continuous processes having several different operations, some PHAs are conducted on each segment of the process and then integrated into one final report.

PHA Procedure

Each PHA addresses the following items:

- hazards of the process,
- previous incident(s) with catastrophic consequences,
- engineering and administrative controls including detection methodologies for early warning of releases such as process monitoring and control instrumentation with alarms, detection hardware, etc.
- consequences of failure of engineering and administrative controls,
- facility siting,
- human factors, and
- qualitative evaluation of a range of possible safety and health effects of failure of controls on employees safety and health.

Performing PHAs

PHAs are performed by a PHA team with expertise in engineering and process operations, including at least one employee having experience and knowledge specific to the process being evaluated. Also, one team member must be knowledgeable in the specific process hazard analysis methodology used.

As previously addressed, the PHA team leader is a member of the Central Safety and Health Committee's Inspections and Audits task group. The team leader meets monthly with the Inspections and Audits task group and reports on the teams plans and progress.

The PHA team has the major responsibility for coordinating the overall facility Process Safety Management Program.

PHA Report Follow-up

All PHA reports are prepared by the PHA team, the ranking line manager of the process analyzed, the Inspections and Audits task group, and the Central Safety and Health Committee. The Central Safety and Health Committee (CSHC) chairman (ranking manager of the facility) assigns specific individuals to be responsible for completing and/or resolving all PHA report recommendations. The PHA team leader maintains a log of all recommendations and reports to the CSHC chairman monthly concerning the status of all unresolved recommendations.

The actions to be taken as the result of PHA report recommendations, including a schedule for completion, are communicated by the PHA team leader to the process managers involved, maintenance, and other employees whose work assignments are in the process and who may be affected by the recommendations or actions.

PHA Updates

The PHA's are updated and revalidated by the PHA team at least every 5 years after completion of the initial PHA to assure that the PHA is consistent with the current process.

PHA Retention

All PHA's and updates or re-validation's are retained for the life of the process.

OPERATING PROCEDURES

Operating procedures have been developed and implemented which describe tasks to be performed, dates to be recorded, operating conditions to be maintained, samples to be collected, and safety and health precautions to be taken.

The procedures are thoroughly reviewed and approved to ensure they are technically accurate. Employees assist in the preparation of the procedures and verify that they are understandable to employees. All operating procedures are routinely reviewed and revised as necessary to ensure they reflect current operations.

Process safety information compiled to assist in conducting process hazards analyses is also used as a resource for assuring the process operating procedures and practices are consistent with the known hazards and operating parameters are accurate.

The operating procedures are reviewed by the engineering staff and operating personnel to ensure they are accurate and provide practical instructions on how to perform jobs safely. Specific instructions and details are included in the operating procedures describing what steps are to be taken or followed, including applicable safety precautions and implications, pressure limits, temperature ranges, flow rates and what to do when the operating limits, ranges and rates

are abnormal. Also, the actions needed to correct and/or control upset conditions are included in the procedures.

The training program ensures that operating personnel have a full understanding of the operating procedures including verification that workers not fluent in English understand the procedures. All process and equipment changes are included as necessary in operating procedures and personnel trained to ensure they are properly informed of all pertinent changes. The operating procedures also include controls for maintenance personnel and contractors to enter the process area and to verify they have completed their authorized jobs.

EMPLOYEE TRAINING

All employees, including maintenance and contractor employees, involved with highly hazardous chemicals are trained to ensure they fully understand the safety and health hazards of the chemicals and processes they work with to protect themselves, and citizens living near the facility.

The training employees receive in compliance with OSHA's hazard communication standard 29 CFR 1910.1200 helps them become more knowledgeable about the chemicals they work with as well as familiarize them with reading and understanding MSDSs. However, additional training is provided concerning operating procedures; safe work practices; emergency procedures including alarms, special assignments, evacuation, and emergency response; safety rules and procedures; routine and non-routine work authorization; and other pertinent process safety information.

The employees to be trained and the subjects to be covered have been defined and documented. Also, the training goals and objectives have been established and written in clear measurable terms. These training goals and objectives are tailored to each specific training module or segment. The important actions and conditions under which employees demonstrate competence and knowledge as well as acceptable performance have been described and documented.

Hands-on training is provided employees to enhance their senses beyond listening, including dry runs and simulated operations to help employees feel the full reality of the situation under controlled conditions.

Along with the hands-on training, employees receive traditional classroom instruction including lectures, videos, programmed instruction, and on-the-job instruction. Employees are encouraged to actively participate in all training activities and practice their skills and knowledge.

The training programs are periodically evaluated to see if the necessary skills, knowledge, and routines are being properly understood and implemented by the trained employees. The means/methods for evaluating the training programs has been developed and implemented including assigned responsibility and reports.

Any training program deficiencies detected during the evaluation are documented and recommendations made to correct them. Retraining or more frequent refresher training is provided as needed to ensure an effective training program. Each employee trained is requested

to complete a training critique to obtain information on how to improve the training process. Also, trainees are consulted as to how to improve the training programs.

Maintenance and contract employees receive current and updated process safety training, including training about process changes which may affect their jobs. Responsibility is assigned for maintenance and contractor employee training and records maintained. They are also consulted about the effectiveness of their training programs.

CONTRACTORS

A screening process has been established for hiring contractors to perform work in and around processes that involve highly hazardous chemicals. The screening process is designed to ensure that the contractors hired or used can accomplish their assigned tasks without compromising the safety and health of employees at the facility. The screening program involves obtaining information on the contractor's safety performance, including injury and illness rates and experience. Also, contractor references are contracted concerning the contractor's safety performance.

In addition to reviewing the contractor's safety performance, the contractor's job skills, knowledge, and certifications (such as pressure vessel welders) are also reviewed. A site injury and illness log is maintained for contractors working on or adjacent to processes to provide full knowledge of process injury and illness experience. This information is used by those auditing the process safety management program compliance and those investigating process incidents.

Workplace controls have been established to ensure that contractors perform their work safely. These controls specify that work permits are required for all contractor work on or adjacent to a process. The permit keeps all operating personnel and affected personnel informed concerning contractor work activities.

PRE-STARTUP SAFETY

Process hazard analyses (PHA's) are used for new processes to improve the design and construction of the process from a reliability and quality standpoint. The PHA recommendations are implemented before final installations are complete. Other items completed prior to initial process startup include piping and instrument diagrams, operating procedures, and operating personnel trained.

The initial startup and normal operating procedures are fully evaluated as part of the pre-startup review to assure a safe transfer into the normal operating mode for meeting the process parameters.

Management of change procedures are required for changes to existing processes that have been shut down for turnaround or modifications. Also, all changes other than "replacement in kind" made to the process during shutdown go through the management of change procedures. Piping and instrument diagrams and operating procedures are updated as necessary following changes. Significant changes impacting the process result in refresher and/or additional employee training.

Incident investigations, compliance, audits, and PHA reports are evaluated to determine their impacts they may have prior to startup of new processes.

MECHANICAL INTEGRITY

An on-going mechanical integrity program is used to ensure safe process operation. Reviews of maintenance programs and schedules are periodically conducted to see if only "breakdown" maintenance is being used. Where such is the case, corrections will be made. Equipment used to process, store, or handle highly hazardous chemicals are designed, constructed, installed, and maintained to minimize releases. To accomplish this, an effective mechanical integrity program has been established to ensure the continued integrity of process equipment.

Elements

The elements of the mechanical integrity program include the identification and categorization of equipment and instrumentation, inspections and tests, testing and inspection frequencies, development of maintenance procedures, training of maintenance personnel, criteria for acceptable test results, documentation of test and inspection results, and documentation of manufacturer's recommendations as to the meantime for failure of equipment and instrumentation.

Priority

The priority for safe process equipment operation is:

1. Primary Lines of Defense

- a. Operate and maintain the process as designed and keep chemicals contained.
- b. Controlled release of chemicals through venting to scrubbers or flares, or to surge or overflow tanks which are designed to receive such chemicals, etc.

2. Secondary Lines of Defense

- a. Fixed fire protection systems like sprinklers, water spray, or deluge systems, monitor guns, etc.; dikes, designed drainage systems, and other systems which would control or mitigate hazardous chemicals once an unwanted release occurs.
- b. The mechanical integrity program protects the above lines of defense and ensures effective highly hazardous chemical control.

Steps

The mechanical integrity program includes the following stages:

1. Process Equipment and Instrumentation List

- a. A list of all process equipment and instrumentation has been compiled and categorized including:
- b. pressure vessels,
- c. storage tanks,
- d. process piping,
- e. relief and vent systems,
- f. fire protection systems components,
- g. emergency shutdown systems and alarms and interlocks, and pumps.

The equipment and instrumentation is categorized on a priority basis for items requiring closer scrutiny than other items. This priority and the manufacturer's data or operating experience determines the inspection and testing frequency and associated procedures.

Applicable codes and standards which provide information for the inspection and testing frequency and appropriate methodologies include:

- a. National Boiler Inspection Code, or
- b. American Society for Testing and Material,
- c. American Petroleum Institute,
- d. National Fire Protection Association,
- e. American National Standards Institute,
- f. American Society of Mechanical Engineers, and
- g. Other groups.

Inspections

The applicable codes and standards are used to provide criteria for external inspections for such items as foundation supports, anchor bolts, concrete or steel supports, guy wires, nozzles and sprinklers, pipe hangers, grounding connections, protective coatings and insulation, and external metal surfaces of piping and vessels, etc.

These codes and standards also provide information on methodologies for internal inspection, and a frequency formula based on the corrosion rate of the materials of construction. The erosion of internal and external surfaces is considered along with corrosion effects of pipes and valves. When the corrosion rate is not known, a maximum inspection frequency is followed until the specific corrosion rate has been determined.

The internal inspection covers items such as vessel shell, bottom and head; metallic linings; nonmetallic linings; thickness measurements for vessels piping; inspection for erosion; corrosion, cracking and bulges; internal equipment like trays, baffles, sensors and screens for erosion, corrosion or cracking and other deficiencies.

Although some inspections may be performed by state and local government inspectors under state and local statutes, procedures have been established to ensure that tests and inspections are conducted properly and consistency is maintained even when different employees may be involved.

Training

Appropriate training is provided maintenance personnel to ensure they understand the preventative maintenance program procedures, safe practices, and the proper use and application of special equipment or unique tools that may be required.

Quality Assurance

A quality assurance system is provided to help ensure that the proper materials of construction are used, that fabrication and inspection procedures are proper, and that installation procedures recognize field installation concerns.

The quality assurance program is an essential part of the overall mechanical integrity program and helps maintain the primary and secondary lines of defense for preventing unwanted chemical releases or those which control or mitigate a release.

"As built" drawings, together with certifications of coded vessels and other equipment, and materials of construction are verified and retained in quality assurance documentation. Equipment installation jobs are inspected in the field for use of proper materials and procedures and to assure that qualified craftsmen are used. Also, the use of proper gaskets, packing, bolts, valves, lubricants, and welding rods are verified in field inspections. The procedures for installation of safety devices are verified in the field, such as the torque on the bolts for rupture discs, uniform torque on flange bolts, proper installation of pump seals, etc.

Where the quality of parts is a problem, audits of equipment supplier's facilities are conducted to ensure the equipment is suitable for its intended service. All necessary changes in process equipment go through the management of change procedures.

NONROUTINE WORK AUTHORIZATIONS

Non-routine work performed in process areas is controlled in a consistent manner. The hazards identified involving the work to be accomplished is communicated to those performing the work and to operating personnel whose work could affect the safety of the process.

A work permit procedure describes the steps the maintenance supervisor, contractor representative or other person needs to follow to obtain the necessary clearance to get the job started. The procedure references and coordinates applicable are:

- a. lockout/tagout procedures,
- b. line breaking procedures,
- c. confined space entry procedures, and
- d. hot work authorizations.

MANAGING CHANGE

Temporary and permanent changes to process chemicals, technology, equipment and facilities are managed to ensure effective process safety management. This process safety management program describes the overall management system used to assure a safe and healthful workplace from process hazards. Management of change is part of the process safety management system. Both technical and mechanical changes must be authorized.

Process changes include all modifications to equipment, procedures, raw materials and processing conditions other than "replacement in kind." The changes are identified, reviewed, and authorized prior to implementing the change. A Process Change Authorization is required for all changes to ensure the operating procedures contain the operating parameters (pressure limits, temperature ranges, flow rates, etc.) and the importance of operating within the limits. See the following process change authorization form.

Management of change covers changes such as process technology changes, and changes to equipment and instrumentation. Changes in process technology requiring authorization include, but are not limited to, changes in production rates, raw materials, experimentation, equipment unavailability, new equipment, new product development, change in catalyst and changes in operating conditions to improve yield or quality.

Equipment changes requiring authorization include, but are not limited to, changes in materials of construction, equipment specifications, piping pre-arrangements, experimental equipment, computer program revisions, and changes in alarms and interlocks.

The process change authorization is not only used to assure that temporary and permanent changes can be accomplished safely, but to ensure that following the change that processes are returned to the normal operating state and original designed state. Also, the process change authorization assures that the pertinent safety and health considerations are incorporated into the operating procedures and the process.

All process change authorizations are filed for reference by PHA teams and others reviewing, evaluating, and/or inspecting processes.

INCIDENT INVESTIGATIONS

Process incidents which result in or could reasonably have resulted in a catastrophic release of highly hazardous chemicals are investigated, including "near misses," within 48 hours of the incident (initiated). The purpose of these incident investigations is to identify the underlying

causes of the incident and to implement corrective action to prevent similar incidents and avoid repeating past mistakes.

Team

Process incidents are investigated by a process incident investigation team under the Accident Investigation task group. One task group member chairs the team and reports through the task group chairman to the ranking facility manager who chairs the Central Safety and Health Committee. The process incident investigation team has received special training in process incident investigation, including how to conduct interviews and report preparation. Both management and employees are included as team members and is multidisciplinary.

One supervisor and one employee knowledgeable of the process is added to process incident investigation teams to ensure effective investigations. The team gathers the facts of the incident, analyzes them and develops plausible scenarios as to what happened, and why.

Employees and supervisors in the process area where the incident occurred are consulted and interviewed to obtain incident facts. The focus of the investigation is to obtain facts and not to place blame. The team and the investigation process deals with all involved individuals in a fair, open and consistent manner. An incident report is prepared following the investigation which includes the findings, conclusions, and recommendations. The written report which is to the ranking manager of the process involved is verbally reviewed with him or her prior to distribution.

Copies of the report are distributed to the ranking manager of the entire facility, the accident investigation task group, and other affected groups and individuals.

The process incident investigation team is responsible for assuring that all report recommendations are completed or resolved by those responsible for the follow-up. Monthly status reports are presented on incident recommendations at each Central Safety and Health Committee meeting by the chairman of the Accident Investigations task group.

EMERGENCY PREPAREDNESS

The Fire and Emergency Task Group is responsible for assuring proper emergency preparedness and response, including what actions employees are to take when there is an unwanted release of highly hazardous chemicals.

Emergency Action and Fire Prevention Plans have been established that comply with OSHA standard 29 CFR 1910.38. These plans describe the actions employees must take in the event of an emergency. These actions may involve special emergency duties or evacuation. Refer to the Emergency Action and Fire Prevention plans for specific details.

The emergency action plan includes the prompt evacuation of employees due to an unwanted release of highly hazardous chemicals. This plan involves emergency alarms to alert employees when to evacuate. Prompt evacuation is essential, including physically impaired employees who are provided the necessary support and assistance. Also, the use of process control centers in process areas as safe areas is prohibited since they may have not been designed for safe refuge.

When unwanted releases of highly hazardous chemicals may occur outdoors, wind direction indicators have been placed at the highest point that can be seen throughout the process area. These indicators allow employees to move cross wind to upwind to gain safe access to refuge areas.

Minor emergency or incidental releases of unwanted highly hazardous chemicals in the process area are handled by highly trained, designated employees wearing appropriate personal protective equipment and following specific procedures. Preplanning for handling incidental releases for minor emergencies in the process area has been accomplished, including hazard communication training per OSHA standard 29 CFR 1910.1200, emergency action and fire prevention plans per OSHA standard 29 CFR 1910.38, and emergency response per OSHA standard 29 CFR 1910.120.

The specific employee actions which must be taken for incidental and major unwanted releases of highly hazardous chemicals have been designated in the emergency action plan. Also, the required actions to obtain outside assistance from mutual aid groups or local government emergency response organizations have been defined in the emergency action plan.

The emergency action plan and fire prevention plan describes the emergency organization and command system, including an on-scene incident commander and staff. This fully trained organization has been properly equipped to carry out their assigned duties.

Drills, training exercises, and simulations with local community emergency response planners and responsible organizations have been conducted and are conducted on a periodic basis. This cooperation with local emergency agencies also assists in complying with EPA's Risk Management Plan Criteria.

An emergency control center has been established at the facility in a safe area away from the process area. This center serves as the major communication link between the on-scene incident commander and plant or corporate management as well as with local emergency organizations and officials. Communication equipment in the center includes a network for receiving and transmitting information by telephone, radio or other means. A back-up communications network is provided in case of power failure or one communication system fails.

The emergency control center is equipped with plant layout and community maps, utility drawings including firefighting water sources, emergency lighting, appropriate reference materials such as government agency notification lists, company telephone lists, SARA Title III reports, material safety data sheets, emergency plans and procedures manual, listing of local emergency response equipment, mutual aid information, and access to meteorological or weather condition data and dispersion modeling data.

COMPLIANCE AUDITS

The PHA team is responsible for assembling a compliance audit team to audit compliance with OSHA's process safety management standard 29 CFR 1910.119 at least every three years. Normally, the entire process hazards team plus a member of the rules and procedures task group not on the PHA team and the facility safety/health manager are assigned to the team. The

chairman of the PHA team is the compliance audit team chairman unless he or she is responsible for the process(es) being audited to ensure compliance. In that case, a person knowledgeable in audit techniques and who is impartial towards the facility area being audited is appointed chairman of the Inspection and Audits task group.

The audit includes an evaluation of the design and effectiveness of the process safety management system and a field inspection of the safety and health conditions and practices to ensure compliance. The essential elements of the audit program include:

- a. planning,
- b. staffing,
- c. conducting the audit,
- d. evaluation,
- e. recommendations,
- f. corrective action,
- g. follow-up, and
- h. documentation.

An OSHA standard 29 CFR 1910.119 process safety management checklist is used by the audit team to conduct the audit. Also, a standardized form is used to document each audit step and ensure an effective audit is conducted and proper follow-up is accomplished. All team members and their expertise are listed. If the needed expertise is not available, it is obtained prior to conducting the audit. The standardized audit form includes:

- a. process description and documentation,
- b. process safety information,
- c. training,
- d. procedures,
- e. physical inspection of the facility,
- f. work authorizations,
- g. interviews with all levels of facility personnel,
- h. findings,
- i. conclusions,

- j. recommendations, and
- k. follow-up.

The compliance audit team issues the final audit report to the chairman of the PHA team with copies to the Inspections and Audits task group chairman and the chairman of the Central Safety and Health Committee who is the ranking facility manager. The audit team is responsible for ensuring that all report recommendations are completed or resolved. Written monthly progress reports are issued to the Inspections and Audits task group chairman who gives monthly status reports to the Central Safety and Health Committee until all items are resolved.

All affected persons and groups are informed of the audit findings, conclusions, and recommendations. The Central Safety and Health Committee chairman assigns specific responsibility for follow-up including revision of the process safety management program, revised operating procedures, improved training, etc. The PHA team has the overall responsibility to ensure that the necessary actions are taken to maintain an effective process safety management program.

SAFETY AND HEALTH HAZARD CONTROL TEAM

Effective safety and health programs prevent accidents, injuries and illnesses through proper recognition, evaluation and control of safety and health hazards. Emphasis is placed on prevention, not after-the-fact accident investigation. Thus, products, processes, workplaces and environments must be made safe through design. To ensure proper safety and health engineering controls, each organization and facility should establish and maintain effective safety and health hazard control teams.

Accidents are costly for organizations and individuals. Correcting safety and health problems after an accident occurs is expensive. A proactive approach must be taken to eliminate and/or control safety and health hazards before accidents, injuries and/or illnesses occur. The Safety and Health Hazard Control Team can help accomplish this objective.

Purpose

To recognize, evaluate and control safety and health hazards before they cause accidents, damage, injuries and/or illnesses.

Fundamentals

The following priority is utilized to control recognized safety and health hazards.

- a. Eliminate hazards by substitution or engineering controls
- b. Reduce the risks when hazards cannot be eliminated by substitution, employee rotation, or limited exposure
- c. Provide safety devices (guards, interlocks, etc.)

- d. Provide warning signs, placards or tags
- e. Provide procedures, education and training, and protective equipment
- f. Assure that procedures are feasible, that they can be followed and the job can still be done
- g. Enforce safety rules and procedures

Organization

The Safety and Health Hazard Control (SHHC) Team is chaired by a facility manager or supervisor with strong engineering knowledge and experience. He or she is a member of the Inspections and Audits Task Group of the Central Safety and Health Committee.

Members of the SHHC Team include at least one representative from each major department within the facility including staff, supervisors and employees.

Meetings

The SHHC Team meets monthly for about 45 minutes to plan their activities and report on their findings, conclusions and recommendations. Minutes are kept and provided to the Inspections and Audits Task Group Chairman.

Activities

The following activities are some of the many things the team considers.

- a. **New Facilities, Processes and Equipment**
The team develops implements and maintains effective procedures for performing safety and health evaluations of new facilities, processes and equipment.
- b. **Modified Facilities, Processes and Equipment**
The team develops implements and maintains effective procedures for reviewing potential safety and health hazards associated with modified or revised facilities, processes and equipment.
- c. **Accident/Incident Analysis**
The team develops implements and maintains effective procedures for analyzing accidents and/or incidents which involve basic design (engineering) defects. These procedures are developed in cooperation with the Accident Investigation Task Group.
- d. **Process Hazard Analyses**
The team develops implements and maintains effective procedures and systems for performing periodic (usually annual) process hazard analyses of all major facility processes. Written process hazard analysis reports are presented to the Inspections and Audits Task Group Chairman and to the Central Safety and Health Committee.

Responsibilities

Each SHHC Team member is given a specific assignment (activity) to coordinate. He or she obtains assistance from other facility supervisors and employees in effectively coordinating the assignment.

Staff Assistance

The facility staff safety and health manager, supervisor and/or coordinator meets with the Team and provides assistance as needed to ensure the Team has the necessary resources.

Trade Secrets

From the applicable OSHA regulations on Process Safety management, FYI:

“Employers shall make all information necessary to comply with the section available to those persons responsible for compiling the process safety information (required by paragraph (d) of this section), those assisting in the development of the process hazard analysis (required by paragraph (e) of this section), those responsible for developing the operating procedures (required by paragraph (f) of this section), and those involved in incident investigations (required by paragraph (m) of this section), emergency planning and response (paragraph (n) of this section) and compliance audits (paragraph (o) of this section) without regard to possible trade secret status of such information.”

Nothing in this paragraph shall preclude the employer from requiring the persons to whom the information is made available under paragraph (p)(1) of this section to enter into confidentiality agreements not to disclose the information as set forth in 29 CFR 1910.1200.

Subject to the rules and procedures set forth in 29 CFR 1910.1200(i)(1) through 1910.1200(i)(12), employees and their designated representatives shall have access to trade secret information contained within the process hazard analysis and other documents required to be developed by this standard.

NEXTSUN ENERGY, LLC
Respiratory Protection Process

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NEXTSUN ENERGY, LLC

Respiratory Protection Process

1. **PURPOSE**

The purpose of this process is to comply with the OSHA standards on Respiratory Protection.

2. **SCOPE**

This process applies to all jobsites where respiratory hazards may exist for:

3. NextSun Energy, LLC (NSE)
4. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
5. All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **REFERENCES**

29 CFR 1910.134

4. **RESPONSIBILITIES**

- a. **MANAGEMENT** - It is management's responsibility to determine what specific applications require use of respiratory equipment. Management must also provide proper respiratory equipment to meet the needs of each specific application. Employees must be provided with adequate training and instructions on all equipment.
- b. **MANAGEMENT/SUPERVISORY** - Superintendents, supervisors, foremen, or group leaders of each area are responsible for insuring that all personnel under their control are knowledgeable of the respiratory protection requirements for the areas in which they work. They are also responsible for insuring that their subordinates comply with all facets of this respiratory process, including respirator inspection and maintenance.
- c. **EMPLOYEES** - It is the responsibility of the employee to have an awareness of the respiratory protection requirements for their work areas (as explained by management), according to proper instruction, and for maintaining equipment in a clean and operable condition.

5. **REQUIREMENTS & GUIDELINES**

- a. NSE Safety Director is designated as the process administrator and shall be qualified by appropriate training or experience that is commensurate with the complexity of the process to administer or oversee the respiratory protection process and conduct the required evaluations of process effectiveness.
- b. In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective of this process shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials).
- c. Respirators shall be provided by NSE at no cost to employees when such equipment is necessary to protect the health of the employee. NSE shall provide the respirators which are applicable and suitable for the purpose intended. NSE shall be responsible for the establishment and maintenance of a respiratory protection process.
- d. The guidelines in this process are designed to help reduce employee exposures against occupational dusts, fumes, mists, radionuclide, gases and vapors.
- e. The primary objective is to prevent atmospheric exposure to these contaminants.
- f. Where feasible, exposure to contaminants will be eliminated by engineering controls (for example, general and local ventilation, enclosure or isolation, and substitution of a less hazardous process or material).
- g. When effective engineering controls are not feasible, use of personal respiratory protective equipment may be required to achieve this goal and shall include the following components, as applicable:
 - $\frac{3}{4}$ Selection of respirators
 - $\frac{3}{4}$ Medical evaluation
 - $\frac{3}{4}$ Fit testing
 - $\frac{3}{4}$ Types of respiratory equipment and their use
 - $\frac{3}{4}$ Maintenance and care of respirators
 - $\frac{3}{4}$ Breathing air quality and use
 - $\frac{3}{4}$ Identification of filters, cartridges, and canisters
 - $\frac{3}{4}$ Employee training and information

¾ Process evaluation

- h. In any jobsite where respirators are necessary to protect the health of the employee or whenever respirators are required, NSE shall establish and implement a written respiratory protection process with worksite-specific procedures. The process shall be updated as necessary to reflect those changes in jobsite conditions that affect respirator use. The employer shall include in the process the following provisions of this section, as applicable:
 - ¾ Procedures for selecting respirators for use at the jobsite;
 - ¾ Medical evaluations of employees required to use respirators;
 - ¾ Fit testing procedures for tight-fitting respirators;
 - ¾ Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;
 - ¾ Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;
 - ¾ Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;
 - ¾ Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
 - ¾ Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and
 - ¾ Procedures for regularly evaluating the effectiveness of the process.
- i. NSE shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and jobsite and user factors that affect respirator performance and reliability.
- j. NSE shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.
- k. NSE shall identify and evaluate the respiratory hazard(s) at the jobsite. This evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where NSE cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.
- l. NSE shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

- m. The employer shall provide the following respirators for employee use in IDLH atmospheres:
 - ¾ A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
 - ¾ A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
 - ¾ Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

n. All oxygen-deficient atmospheres shall be considered IDLH, except if NSE can demonstrate that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in the table at right (for the altitudes set out in the table), then any atmosphere-supplying respirator may be used.

Altitude (ft.)	Oxygen deficient Atmospheres (% O ₂) for which the employer may rely on atmosphere-supplying respirators
Less than 3,001	16.0–19.5
3,001–4,000	16.4–19.5
4,001–5,000	17.1–19.5
5,001–6,000	17.8–19.5
6,001–7,000	18.5–19.5
7,001–8,000 ¹	19.3–19.5

¹ Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet.

o. NSE shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

p. NSE shall not permit respirators with tight-fitting face pieces to be worn by employees who have:

- ¾ Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or
- ¾ Any condition that interferes with the face-to-facepiece seal or valve function.

q. If an employee wears corrective glasses or goggles or other personal protective equipment, NSE shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

r. For all tight-fitting respirators, NSE shall ensure that employees perform a user seal check each time they put on the respirator using safety procedures in 29 CFR 1910.146 Appendix B-1 or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as those in Appendix B-1.

s. Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree

of employee exposure or stress that may affect respirator effectiveness, NSE shall reevaluate the continued effectiveness of the respirator.

- t. NSE shall ensure that employees leave the respirator use area:
 - $\frac{3}{4}$ To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use; or
 - $\frac{3}{4}$ If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece; or
 - $\frac{3}{4}$ To replace the respirator or the filter, cartridge, or canister elements.
- u. If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, NSE must replace or repair the respirator before allowing the employee to return to the work area.
- v. For all IDLH atmospheres, NSE shall ensure that:
 - $\frac{3}{4}$ One employee or, when needed, more than one employee is located outside the IDLH atmosphere;
 - $\frac{3}{4}$ Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;
 - $\frac{3}{4}$ The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;
 - $\frac{3}{4}$ NSE representative or designated supervisor is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue;
 - $\frac{3}{4}$ The representative or designated supervisor authorized to do so by NSE, once notified, provides necessary assistance appropriate to the situation;
- w. Employee(s) located outside the IDLH atmospheres are equipped with:
 - $\frac{3}{4}$ Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
 - $\frac{3}{4}$ Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
 - $\frac{3}{4}$ Equivalent means for rescue where retrieval equipment is not required.

- x. Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, NSE shall reevaluate the continued effectiveness of the respirator.

6. MAINTENANCE AND CARE OF RESPIRATORS

- a. NSE shall provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.
- b. NSE shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. NSE shall ensure that respirators are cleaned and disinfected using procedures required by OSHA, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness.
- c. The respirators shall be cleaned and disinfected at the following intervals:
 - $\frac{3}{4}$ Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;
 - $\frac{3}{4}$ Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals;
 - $\frac{3}{4}$ Respirators maintained for emergency use shall be cleaned and disinfected after each use; and
 - $\frac{3}{4}$ Respirators used in fit testing and training shall be cleaned and disinfected after each use.
- d. NSE shall ensure that all respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and exhalation valve.
- e. Additionally, emergency respirators shall be:
 - $\frac{3}{4}$ Kept accessible to the work area;
 - $\frac{3}{4}$ Stored in compartments or in covers that are clearly marked as containing emergency respirators; and
 - $\frac{3}{4}$ Stored in accordance with any applicable manufacturer instructions.

- f. NSE shall ensure that respirators are inspected as follows:
 - ³/₄ All respirators used in routine situations shall be inspected before each use and during cleaning;
 - ³/₄ All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and
 - ³/₄ Emergency escape-only respirators shall be inspected before being carried into the jobsite for use.

- g. NSE shall ensure that respirator inspections include the following:
 - ³/₄ A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and
 - ³/₄ A check of elastomeric parts for pliability and signs of deterioration.

- h. In addition to other requirements of this process, self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. NSE shall determine that the regulator and warning devices function properly.

- i. For respirators maintained for emergency use, NSE shall:
 - ³/₄ Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and
 - ³/₄ Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

7. SELECTION OF RESPIRATORS

- a. Respirators are selected and approved by management. The selection is based upon the physical and chemical properties of the air contaminants and the concentration level likely to be encountered by the employee.

- b. The respirator process administrator will make a respirator available immediately to each employee who is placed as a new hire or as a transferee in a job that requires respiratory protection. Replacement respirators/pre-filters will be made available as required. The

Respirator Process Administrator for NextSun Energy, LLC is the Safety Director.

- c. Standard respirators currently approved by NSE are:
- | | |
|---|---|
| 1. <u>3M "EASI-AIR" 7200S</u>
Dual Cartridge Respirator | 3. <u>3M 8210</u>
N95 Particulate Respirator |
| 2. <u>MSA "COMFO II ELITE" 7-201</u>
Dual Cartridge Respirator | 4. <u>Gerson 1730</u>
N95 Particulate Respirator |
- d. More than one hazard may exist for a given operation and more than one respirator could be used to protect against a number of different air contaminants. Correct respirator selection for each situation however, is a complex job.
- e. Before proper respiratory protection can be assigned, we must consider the nature of the hazard, extent and limitations of respirators. It is important to select the right equipment for the job.
- f. Evaluation of exposure to a toxic air-borne material necessitates:
- $\frac{3}{4}$ Identifying the type of contaminant (mist, dust, vapor, gas, and fume).
 - $\frac{3}{4}$ Logging the name of the contaminant.
 - $\frac{3}{4}$ Listing pertinent physical and chemical properties (LEL, Flash Point, etc.)
 - $\frac{3}{4}$ Estimating or monitoring the concentration of the contaminant in the breathing zone and immediate work area.
 - $\frac{3}{4}$ Noticing the Threshold Limit Value (TLV) -- both OSHA and ACGIH recommended levels.
 - $\frac{3}{4}$ Comparing the surveyed levels to the recommended exposure limits. (Ceiling, short term, time-weighted average).
 - $\frac{3}{4}$ Noting odor threshold, IDLH level, warning properties and if contaminant is an eye irritant.
 - $\frac{3}{4}$ Evaluating whether the contaminant can be trapped by a given sorbent efficiently; or would react with filter media.
 - $\frac{3}{4}$ Recording if the contaminant may cause systemic poisoning by absorption through the skin.
- g. The toxicology of a given contaminant can be assessed when all information outlined above is evaluated on a respirator selection work sheet.

- h. The overall protection afforded by a given respirator design (and mode of operation) may be defined in terms of its assigned protection factor (APF). The APF is a measure of the degree of protection afforded by a respirator, defined as the ratio of the concentration of contaminant in the ambient atmosphere to that inside the enclosure (usually inside the face piece) under conditions of use.
- i. Respirators should be selected so that the concentration inhaled and the APFs are selection and use guides. These guides should only be used when the employer has established a minimal acceptable respirator process as defined in Section 3 of the ANSI Z88.2-1969 Standard.
- j. In addition to face pieces, this includes any type of enclosure or covering of the wearer's breathing zone, such as supplied-air hoods, hardhats or suits.
- k. Review should include dusts, mists, and fumes only. Consideration does not apply when gases or vapors are absorbed on particulates and may be volatilized or for particulates volatile at room temperature. Example: coke oven emissions.
- l. Review also should be given to any single-use dust respirator (with or without valve) not specifically tested against a specified contaminant.
- m. Dust filter refers to a dust respirator and includes all types of media -- that is, both non-degradable mechanical type media and degradable resin- impregnated wool felt or combination wool-synthetic felt media.
- n. Fume filter refers to a fume respirator approved by the lead fume test. All types of media are included.
- o. High-efficiency filter refers to a high-efficiency particulate respirator filter with at least 99.9% efficiency against 0.3 microns in accordance with NIOSH specifications.
- p. For gases and vapors, an APF should only be assigned when published test data indicate the cartridge or canister has adequate sorbent efficiency and service life for a specific gas or vapor. In addition, the APF should not be applied in gas or vapor concentrations that are: (1) immediately dangerous to life, (2) above the lower explosive limit, and (3) cause eye irritation when using a half mask.
- q. A positive pressure supplied-air respirator equipped with a half-mask face piece may not be as stable on the face as a full face piece. Therefore, the APF recommended is half that for a similar device equipped with a full face piece.
- r. A positive pressure supplied-air respirator equipped with a full face piece provides eye protection but is not approved for use in an atmosphere that is immediately dangerous to life.
- s. The design of the supplied-air hood, suit, or hardhat (with a minimum of 170 liters/min. of air) may determine its overall efficiency and protection. For example, when working with the arms over the head, some hoods draw the contaminant into the hood-breathing

zone. This may be overcome by wearing a short hood under a coat or overalls. Other limitations specified by the approval agency must be considered before using in certain types of atmospheres.

- t. The SCBA operated in the positive pressure mode has been tested and the face piece recorded as < 0.01% penetration. Therefore, a PF of 1,000 + is recommended. At this time, the lower limit of detection 0.01% does not warrant listing a higher number. A positive pressure SCBA for an unknown concentration is recommended. This is consistent with the 1,000 + that is listed. It is essential to have an emergency device for use in unknown concentrations. A combination supplied-air respirator in pressure-demand or other positive pressure mode, with auxiliary self-contained air supply, is also recommended for use in unknown concentrations of contaminants immediately dangerous to life. Other limitations, such as skin absorption of HCN or tritium, must be considered.
- u. The protection a respirator may provide for a worker is dependent upon his type of unit and the fit. A respirator protection factor is an indicator of how much protection a respirator may provide. The factor is the ratio of the contaminant concentrations outside vs. inside the respirator, $P = C/C$. This is determined by quantitative testing. The general rule of thumb, however, says the protection factor is the approximate average effectiveness of a given respirator in qualitative tests with good face seal. Under normal operating conditions, the time-weighted average (TWA) concentration x protection factor = maximum concentration of a contaminant against which a particular type of respirator may be used.
- v. For example: If an employee were spray painting with an enamel paint cut with toluene solvent and the measured TWA concentration was 200 ppm, and the TLV (ACGIH) is 100 ppm, then a half mask air purifying respirator with organic vapor trapping cartridges is satisfactory.

8. WORK AREA MONITORING

To ensure the adequacy of a respiratory protection process, monitoring shall be conducted on exposure hazards as a basis to provide for a continuing healthful environment for employees. Personal sampling equipment may be used in accordance with accepted industrial hygiene standards to sample each work area. Results of these samples will pinpoint areas where respiratory protection is required. A "Job Description -- Respirator Specification" Form will also document what type of equipment should be worn for specific hazards present.

9. CARTRIDGE CHANGE SCHEDULE

Using the present available air monitoring data, cartridges will be changed as follows:

ORGANIC VAPOR CARTRIDGES 1 - TIME PER WEEK

GUIDES FOR THE SELECTION OF RESPIRATOR

Hazard

Respirator

GAS OR VAPOR CONTAMINANTS

Oxygen Deficiency

Self-contained breathing apparatus.

Combination air-line respirator auxiliary positive pressure self contained air supply.

Immediately dangerous to life or health

Self-contained breathing apparatus positive pressure mode.

Air-purifying, full face piece respirator with chemical canister gas mask) escape only.
Self-rescue mouth piece respirator (escape only).
Combination air-line respirator with auxiliary positive pressure self-contained air supply.

Not immediately dangerous to life or health

Air-line respirator.
Air-purifying, half-mask of full face piece respirator with chemical cartridge(s) or canister.

PARTICULATE CONTAMINANTS

Immediately dangerous to life or health

Self-contained breathing apparatus positive pressure mode.

Air-purifying full face piece respirator with appropriate filter (for escape only).

Combination air-line respirator with auxiliary positive pressure self-contained air supply.

Not immediately dangerous to life or health

Air-purifying, half-mask or full face piece respirator with filter pad cartridge(s).

Air-line respirator.

Air-line abrasive-blasting respirator

COMBINATION GAS, VAPOR, AND PARTICULATE CONTAMINANTS

Immediately dangerous to life or health

Self-contained breathing apparatus positive pressure mode.

Air-purifying full face piece respirator with chemical canister and appropriate filter (for escape only).

Combination air-line respirator (for escape only).

Combination air-line respirator with auxiliary positive pressure self-contained air supply.

Not immediately dangerous to life or health

Air-line respirator.

Air-purifying, half-mask or full face piece respirator with chemical cartridge or canister and appropriate filter.

10. CLASSIFICATION OF RESPIRATORY HAZARDS TO THEIR PROPERTIES WHICH INFLUENCE RESPIRATOR SELECTION

Gas or Vapor Contaminants

Inert: They do not react with substances under most conditions and create a respiratory hazard by displacing air and producing oxygen deficiency (for example, helium, neon, argon).

Acidic: Substances that are acids or that react with water to produce positively charged hydrogen ions. They taste sour and many are corrosive to tissues (for example, hydrogen dioxide, fluorine, nitrogen dioxide, hydrogen sulfide, and hydrogen cyanide).

Alkaline: Substances that are alkalis or that react with water to produce an alkali. When in water solutions, they taste bitter, And many are corrosive to tissues (for Example, ammonia, amines, phosphine, arsine, and stibine).

Particulate Contaminants

Particles are produced by mechanical means by the disintegration processes of grinding, crushing, drilling, blasting and spraying, or by the physiochemical reactions such as combustion, vaporization, distillation, sublimation, cacination, and condensation.

Particulate are classified as follows:

Dust: A solid mechanically produced particle with sizes varying from submicroscopic to visible or macroscopic.

Spray: A liquid mechanically processed particle with size generally in the visible or macroscopic range.

Fume: A solid condensation particle. Extremely small particle size, generally less than one micron in diameter.

Organic: These are the compounds of Carbon. Examples are: Saturated Hydrocarbon (methane, ethane, butane), Unsaturated Hydrocarbons (ethylene, acetylene), Alcohols (methyl alcohol, propyl alcohol), Ethers (methyle ether, ethyl ether), Aldehydes (formaldehydes), Ketones (dimethyl ketone), Organic acids (formic acid, acetic acid), Halides (chloro-form, carbon tetrachloride), Amides (formamide, acetamide), Nitriles (acetonitrile), Isocyanates (toluene di-isocyanate), Amines (methylamine) Epoxies, (epoxy-ethane, propylene oxide), and Aromatics (benzene, toluene, xylene).

Mist: A liquid condensation particle with sizes ranging from submicroscopic to visible or macroscopic.

Fog: A mist of sufficient concentration to perceptibly obscure vision.

Smoke: A system which includes the product of incomplete combustion of organic substances in the form of solid and liquid particles and gaseous products in air. Smoke is usually of sufficient concentration to perceptible obscure vision.

Hydrides: Compounds in which hydrogen is chemically bonded to metals and certain other elements (for example, diborane and lithium hydride).

11. PROTECTION FACTORS FOR RESPIRATORS

Concentrations in multiples of permissible exposure	Face Piece Pressure	Permissible Respirators limits
5X	Negative	Single use dust-Quarter- mask dust
10X	Negative	Half or quarter mask, high efficiency
50X	Negative	Full face piece, high efficiency
100X	Negative	Full face piece, supplied air Self-contained breathing apparatus (SCBA)
	Positive	Powered, high-efficiency, enclosures. Half-mask supplied air, Type C positive pressure demand mode.
1,000X	Positive	Supplied air with full face piece supplied air and auxiliary self-contained air support.

Emergency entry into
unknown concentrations
or fire fighting

Positive

Full face piece SCBA

Escape only 1/

Positive

Any SCBA - Any self rescuer

1/ In an atmosphere which is immediately dangerous to life or health.

NOTES:

1. Half-mask and quarter mask respirators should not be used if particulate matter causes eye irritation at the use concentrations.
2. Full face piece supplied-air respirators should not be used in an atmosphere which is immediately dangerous to life or health unless it is equipped with an auxiliary air supply which can be operated in the positive pressure.

12. MEDICAL EVALUATION

- a. Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and jobsite conditions in which the respirator is used, and the medical status of the employee. Accordingly, this process specifies the minimum requirements for medical evaluation that NSE shall implement to determine the employee's ability to use a respirator.
- b. NSE shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the jobsite. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.
- c. NSE shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire. The medical evaluation shall obtain the information requested by the questionnaire required in this process.
- d. NSE shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2 of the questionnaire, whose initial medical examination demonstrates the need for a follow-up medical examination.
- e. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.
- f. The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.

- g. NSE shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.
- h. Each employee required to wear a respirator will fill out a Medical Evaluation Questionnaire.
- i. The Medical Evaluation Questionnaire will be read by a PLHCP. If the PLHCP determines a follow-up examination is necessary, the employee shall make themselves available, during regular business hours, for the follow-up examination. Once the PLHCP has performed all the required duties a written recommendation shall be rendered by the PLHCP for the type of respirator which can be worn.

13. LIMITATIONS AND SURVEILLANCE

- a. Employees should be physically fit and able to perform job duties while wearing a respirator. If a physician determines that a worker has a severe cardiovascular or pulmonary dysfunction that would be aggravated by wearing a respirator; then by a written PLHCP opinion, that person would be exempted from a job requiring the use of a respirator.
- b. Conditions that may prevent a person from using an atmosphere supplying respirator may include:
 - $\frac{3}{4}$ Emphysema
 - $\frac{3}{4}$ Chronic pulmonary obstructive disease
 - $\frac{3}{4}$ X-ray evidence of pneumoconiosis
 - $\frac{3}{4}$ Coronary artery disease
 - $\frac{3}{4}$ Heart attack
 - $\frac{3}{4}$ Bronchial asthma
 - $\frac{3}{4}$ High blood pressure
 - $\frac{3}{4}$ Epilepsy
 - $\frac{3}{4}$ Diabetes
 - $\frac{3}{4}$ Restrictive heart abnormalities
 - $\frac{3}{4}$ Experiencing anxiety or any problems when wearing a respirator
 - $\frac{3}{4}$ Open hole in the eardrum

- c. Persons should not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. A "yes" answer to any of the preceding questions would constitute a warning sign regarding the use of respirators. A medical opinion to confirm any of the above situations (answered "yes") should then be obtained. The respirator user's medical status should be reviewed periodically (for instance, annually).
- d. No beards or facial hair should interfere with the sealing surfaces of any respirator. If respiratory protective equipment is required for a job, no beards or long sideburns will be allowed, as they will not permit a good face seal.
- e. Contact lenses cannot be worn in an atmosphere that necessitates the use of respirators. No glasses may be worn with a full face piece respirator, unless the face piece is fitted with an adapter.
- f. Should a worker have exposure to certain toxic materials, periodic medical examinations such as urinalysis, blood chemistries, or bioassay may be required even though the employee wears the proper respiratory protective equipment.

14. FIT TESTING

- a. Before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This section specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.
- b. NSE shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.
- c. NSE shall ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter.
- d. NSE shall conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or process administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.
- e. If after passing a QLFT or QNFT, the employee subsequently notifies NSE, process administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested.

- f. The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- g. If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.
- h. Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
- i. Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.
- j. Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.
- k. Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used at the jobsite.

15. IMPLEMENTATION

- a. Employees required to wear a respirator must be fitted properly and tested for a face seal prior to use of the respirator in a contaminated area. Manufacturers provide fitting instructions and use limitations on the product packaging.
- b. Qualitative fit testing is acceptable for most hazards in the work place. (Refer to OSHA standards for specific direction.)
- c. *Fitting* - For a respirator to work effectively, it must fit well and feel comfortable. All the care that went into proper respirator selection will not protect the worker if the face piece does not fit properly. Fitting is most critical for self-contained breathing apparatus and respirators used in IDLH atmospheres. There are two categories of fitting tests: *Qualitative* and *Quantitative*.

³/₄ Qualitative tests include:

- Negative Pressure Test - Close off air inlet of canister, cartridge, or filter with palms, inhale gently so that the face piece collapses. Hold breath for 10 seconds, if the face piece remains slightly collapsed and no inward leakage is detected, the respirator probably has an adequate fit.
- Positive Pressure Test - Close off exhalation valve, exhale gently into the face piece. If a positive pressure can be built up inside the face piece without excess outward leakage, the fit is good. Take care not to disturb placement of the face piece by placing undue pressure on the mask with hand.
- Banana Oil Testing - A worker is subjected to isoamyl acetate vapor (banana oil) adjacent to sealing surfaces of the respirator face piece. If there is a detectable odor inside the mask, then the face piece should be refitted in clean air; and the test repeated, switching respirators if necessary, until a fit is made.
- Irritant Smoke Test - Stannic chloride is impregnated on pumice in glass tubes. When the tube ends are broken, irritant smoke is released. The tester puffs smoke towards the wearer from increasingly shorter distances until the tube is within about 6 inches of the respirator, where the smoke is then directed toward potential sources of leakage. At this point, if no leakage has been detected, the wearer may cautiously begin various head movements to simulate use in particular job. This test has an advantage in that the wearer usually reacts involuntarily to leakage by coughing or sneezing. If there is a reaction, stop producing smoke immediately. The irritant smoke test is valid for testing both air-purifying and atmosphere-supplying respirators; but an air-purifying respirator must have high efficiency filters.

³/₄ Quantitative test uses instruments to measure (quantify) the amount of test chemical outside vs. inside of the respirator. This type of test expresses the amount of leakage as a percentage of the challenge atmosphere outside of the mask. This test is excellent when face piece leakage must be minimized for work in IDLH atmospheres. A quantitative test may be required when employees are exposed to chemical agents like acrylonitrile, benzene, coal tar pitch volatiles or vinyl chloride.

- c. When fitting any face piece the headstraps must be comfortable. Tightening the straps will sometimes reduce leakage, but the wearer may be unable to tolerate the respirator for any length of time; thus invalidating the fitting test for a normal job routine.

16. TYPES OF RESPIRATORY PROTECTIVE EQUIPMENT AND THEIR USES

There are three categories of respirators: (1) air purifying (2) atmosphere supplying and (3) combination respirators. Some of the equipment used in NSE operations are:

a. AIR PURIFYING

³/₄ Single Use Disposal Dust Mask or Filter

This mask protects against dusts and mists having a TLV not less than .05 mg/m³ or 2.0 mppcf. The respirator has a disposal filter and elastic straps for comfort and tight fit.

³/₄ Half Mask Respirator for Dust, Mist Fumes

The respirator covers the mouth and nose and is provided with flexible straps and is either totally disposal or has replaceable cartridges. Not for use in concentrations greater than 10 x TLV.

³/₄ Half Mask Respirator for Gases and Vapors

The half mask chemical cartridge respirator has a rubber facepiece flexible straps, exhalation port and element holders. Screw in cartridges are available for protection against most gases and vapors.

³/₄ Emergency Escape Respirator

This mouthpiece-type respirator offers protection against low concentrations of gases or vapors or may be used for escape from hazardous atmosphere if the chemical cartridge will absorb the contaminant.

b. ATMOSPHERE SUPPLYING

³/₄ Escape Air Supplied Respirator

This device is used for escape only from hazardous atmospheres. The respirator's plastic hood is for fresh air from a pack placed behind the neck.

³/₄ Airline Respirator

Air under pressure is fed to either a larger more flexible hose or regulator where the pressure reduced and the breathing air delivered to a flexible face piece. Types: demand, continuous flow pressure demand.

³/₄ Airline Respirator with Self-contained Escape Cylinder

This unit is similar to the airline respirator and includes a small compressed air bottle with regulator to provide breathable air for work in, and escape from, IDLH atmosphere.

³/₄ Self-Contained Breathing Apparatus -SCBA

Demand and pressure demand SCBA units are used in operations for hazardous work or rescue. The SCBA equipment includes a compressed air cylinder, regulator, flexible hose to a full face piece, and shoulder harness.

³/₄ Abrasive Blasting Hood

A hardhat and protection apron fed by air from a compressor or cascade of cylinders that is used for protection in sandblasting and may be fitted with a vortex tube to assist in cooling worker.

17. AIRLINE RESPIRATOR WITH ESCAPE BOTTLE

The airline respirator with full face piece in the pressure- demand mode is designed for use in atmospheres immediately dangerous to life or health when used with an approved emergency escape system. With the potential hazards involved when using this respirator, it is imperative that this type of equipment be inspected before and after each use.

a. Before entry into a hazardous area, check the following:

- ³/₄ Hose length to the escape unit from a compressor or bottle cascade system should be adequate to perform all types of work, but not greater than 300 feet.
- ³/₄ All connections should be tight and free of leaks. Rubber hose from the face piece to the regulator and hand disconnect union should be hand tight only.
- ³/₄ The face piece and all hoses should be free of cracks and the regulators functioning normally at recommended pressures.
- ³/₄ The air pressure in the emergency escape bottle should be approximately 2100 pounds per square inch (PSI).
- ³/₄ Face seal on respirator should be good by using negative pressure test.
- ³/₄ Make sure the respirator works properly before entering a contaminated area.

b. When using an airline respirator with an emergency escape bottle:

- ³/₄ Never over-pressure the regulator.
- ³/₄ The bottle should be used for escape from a hazardous atmosphere. Do not breathe from the bottle during normal work. Do not turn on the air supply from the bottle except to escape from a hazardous area, if the main air supply has been cut off.
- ³/₄ After the escape cylinder has been used or the air pressure is below the recommended level (2100 PSI), the foreman at the job site should be notified and the foreman should then see that this equipment is refilled with certified breathing air.

³/₄ Exposure to high levels of contaminants requires that all exposed skin be properly protected.

18. SELF CONTAINED BREATHING APPARATUS

- a. Self contained breathing apparatus (SCBA) should be used for emergencies like clean-up of a large spill, fire fighting, or rescue from a hazardous area. The equipment must be checked before and after each use and at least monthly. Routine inspection of this equipment assures that it will be ready for use in an emergency.
- b. Thirty (30) minute SCBA units provide protection against most air-borne agents and are an excellent back-up system when tank cleaning, vessel entry or breaking into lines is done with airline-SCBA equipment.

³/₄ Before Using Any SCBA Equipment:

- Inspect the connections for tight fit and possible leaks.
- Inspect all parts of the respirator for damage or excessive wear. Check low air pressure alarm.
- Check the air pressure in the cylinder, it should read approximately 2100 PSI, and check the air flow to the face piece.
- Make sure you can get a good face seal. Use the negative pressure fitting test to check the fit. Do not wear this apparatus if you have a beard, long side burns or wear glasses.
- Be sure you have been properly instructed before using this equipment.

³/₄ When Using SCBA Equipment:

- Do not attach the hose from the respirator face piece until you are ready to enter the contaminated area. This will conserve the air supply in the cylinder.
- If the alarm bell rings, signaling a lowered air supply, **LEAVE THIS CONTAMINATED AREA AT ONCE!**
- If air flow is insufficient for any reason, turn on the bypass valve to increase air flow to the face piece and leave the area immediately. Do not return to the hazardous area until the equipment is repaired or a new SCBA unit is issued.

³/₄ After Using SCBA Equipment:

- Close all valves and then de-pressure the hose through the by-pass valve.

- Tell the foreman that the cylinder has been discharged. The foreman should then see that the cylinder is properly charged with certified breathing air.
- This equipment should be inspected, tagged and properly stored to protect against damage and to insure ready use.

19. EMERGENCIES AND SPECIAL OPERATIONS

- Self-contained breathing apparatus may be required in specific areas for emergency use. This equipment will be used only by trained personnel when it is necessary to enter hazardous atmospheres. The following points should be considered:
 - $\frac{3}{4}$ All potential users will be fully trained in the use of this equipment.
 - $\frac{3}{4}$ When the equipment is used, it will be tested in an uncontaminated atmosphere prior to entering the hazardous area if possible.
 - $\frac{3}{4}$ An employee will not work with this apparatus in a hazardous atmosphere on an individual basis. At least one additional employee suitably equipped with a similar breathing apparatus must be in contact with the first employee and must be available to render assistance if necessary.
 - $\frac{3}{4}$ This equipment will be inspected monthly by trained division or group personnel.
- There are certain situations where only one type of respiratory protection should be considered. For fire fighting and rescue from a hazardous atmosphere only self-contained breathing apparatus is acceptable. In confined spaces with IDLH atmospheres only SCBA, airline with escape bottle or other approved equipment should be used.
- Emergencies, such as explosion and fire, release of high concentrations of toxic gas or vapor, and rescue will be discussed at those locations where incidents occur.
- Special operations like tank cleaning, tower maintenance, turnarounds, clean up of large spills, etc., and the use of appropriate respirators, will be covered by safety personnel, superintendents or foremen.
- Before entering areas that could be oxygen deficient or have chemical contaminants of unknown concentration, the work environment should be monitored with available equipment to determine exposure levels. If the proper equipment is not on hand or special monitoring is required, contact the Site Supervisor or NSE Safety Director; if unavailable and on a client's work location, contact the client's safety personnel.

20. ADDITIONAL RESPIRATOR INFORMATION

a. **Canister Gas Masks**

- ¾ Some operations require the use of canister masks to protect against chemical contaminants. This equipment is designed to filter harmful chemical agents from the air; however, this is not multi-purpose equipment and will not afford protection for all exposures.
- ¾ Each gas mask canister is made for protection from a certain agent or group of agents with similar properties. The manufacturer's instructions for proper use should be followed carefully.
- ¾ Gas masks should not be used if any of the following conditions exists:
 - Oxygen content in work area is below 19.5%.
 - If contaminant concentrations are unknown or are likely to be very high.
 - If the atmosphere has been determined to be immediately dangerous to life or health (IDLH).
 - If any chemical agent in the work area has poor odor warning properties or is odorless like carbon monoxide.
 - If the gas mask is not effective in filtering the chemical agent, i.e. H₂S - hydrogen sulfide.
 - If gas masks are used, then canisters must be used prior to the expiration date.
- ¾ Wearer must leave the contaminated area if:
 - Any odor is detected within mask.
 - The canister is noticeably causing an increase in breathing resistance.
- ¾ Gas mask canisters should be changed after each use.
- ¾ All instructions for proper use should be followed.

21. MAINTENANCE AND CARE OF RESPIRATORS

- a. The following points should be considered for respirator inspection and maintenance:
 - $\frac{3}{4}$ The wearer of a respirator will inspect it daily whenever it is in use.
 - $\frac{3}{4}$ Supervisor, foreman, or group leader will periodically spot check respirators for fit, usage, and condition.
 - $\frac{3}{4}$ Respirators not discarded after one shift use, will be cleaned on a daily basis, according to the manufacturer's instructions, by the assigned employee or other person designated by the respirator process coordinator.
 - $\frac{3}{4}$ Respirators not discarded after one shift use, will be stored in a suitable container away from areas of contamination.
 - $\frac{3}{4}$ Whenever feasible, respirators not discarded after one shift use, will be marked or stored in such a manner to assure that they are worn only by the assigned employee. If used by more than one employee is required, the respirator will be cleaned between uses.
- b. Maintenance of respiratory protective equipment is essential to the overall effectiveness of the process. Wearing a poorly maintained or malfunctioning respirator could be more hazardous than not having any respirators available. A worker wearing a defective respirator thinks he is fully protected when, in reality, he may not be.
- c. Emergency equipment must be maintained routinely. Self-contained breathing apparatus is generally used in the most hazardous and demanding circumstances; wearing a defective unit could have lethal results.
- d. Equipment should be repaired by trained personnel or the manufacturer. Only designated replacement parts should be used when assembling respirators. Substitution of parts from a different brand or type of respirator invalidates approval of the device. All respiratory protective equipment should be cleaned and disinfected. For most respirators, hot soap and water and a hot rinse is adequate. Manufactured disinfectant solutions aid in sterilization. Respirators used in atmospheres immediately dangerous to life or health or for emergencies or rescue should be cleaned after each use.
- e. Respirators should be stored to protect against dust, sunlight, heat, extreme cold, high humidity, corrosive conditions and contamination. Respirators should be protected and stored in a sealed plastic bag in a metal cabinet. If equipment is issued to an employee, it is his/her responsibility to keep it clean and store it in the proper manner.
- f. Emergency equipment should be readily available for use, not under lock and key, and strategically placed for ready access in an emergency.
- g. All respirators should be inspected to check for tightness of the connections, fit of component parts and adjustment of straps on the face piece as follows:

- ¾ Air purifying - when inspecting this type of respirator, be sure to check the headstraps for wear and cracks; face piece for broken element holders or split lens, sealing of exhalation valve, and air purifying elements for correct type, expiration date, gasket seal, and previous use. Reusable air purifying respirators should be inspected before and after each use.
- ¾ Atmosphere supplying - although units differ in construction, examination should include: a check of headstraps and face piece, condition of lines or hoses and connections, and inspection of regulators, valve, cylinders and warning alarms. Most important- respirators for emergency use should be inspected monthly; and the person initializing the record tag should make certain that the SCBA equipment is in good working order. Atmosphere supplying equipment not used routinely should be inspected after use before it is put back into service.

22. BREATHING AIR QUALITY AND USE

This section will assure that breathing air for atmosphere supplied-air respirators is of high quality. When supplied-air is used the following will be required:

- a. Compressed and liquid oxygen will meet Federal requirements.
- b. Compressed breathing will be Type 1 - Grade D as described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989.
- c. Compressors used to supply breathing air will be constructed and situated to prevent entry of contaminated air into the air-supply system, minimize moisture, have suitable in-line air filters, will have a tag on the filter showing last date changed and signature of person changing filter.
- d. Oil lubricated compressors shall have a high temperature alarm or CO alarm, or both; if only a high temperature alarm is used the air supply shall be monitored at intervals sufficient to prevent CO in the breathing air from exceeding 10 PPM.
- e. Breathing air line couplings shall be incompatible with nonrespirable worksite air or gas systems. No asphyxiating substances shall be introduced into the breathing air system.

23. IDENTIFICATION OF FILTERS, CARTRIDGES, AND CANISTERS

All filters, cartridges and canisters used at the jobsite shall be labeled and color coded with the NIOSH approved label and that label will not be removed and will remain legible.

24. EMPLOYEE TRAINING AND INFORMATION

- a. NSE shall provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually and more often

if necessary. This includes providing basic information on respirators to employees who wear respirators when not required by OSHA or NSE to do so.

- b. NSE shall ensure that each employee can demonstrate knowledge of at least the following:
- $\frac{3}{4}$ Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
 - $\frac{3}{4}$ What the limitations and capabilities of the respirator are
 - $\frac{3}{4}$ How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
 - $\frac{3}{4}$ How to inspect, put on and remove, use, and check the seals of the respirator
 - $\frac{3}{4}$ What the procedures are for maintenance and storage of the respirator
 - $\frac{3}{4}$ How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
 - $\frac{3}{4}$ The general requirements of OSHA and NSE's safety process regarding safe use of respirators
- c. Each employee, upon assignment to an area requiring respirators, must be instructed by his superintendent, supervisor, foreman, or group leader relative to their responsibilities in the respiratory process. The "Respirator Issuance and Training" card will be reviewed on a periodic basis with each employee. They will also be instructed in need, use, limitations, and care of their respirator(s).
- d. There are basic components of training that are common to both workers and supervisors. Each person must have an opportunity to handle the respirator, check different fitting techniques, test face piece-to-face seal, and to wear the respirator in normal air prior to starting a job. In addition there should be a discussion of engineering and administrative controls in use, and why respirators also are needed. The nature of the respiratory hazard and what happens if the respirator is not worn, or used improperly should be explained.
- e. The employees should be informed why a particular type of respirator has been selected; and how to use respirators in emergencies and special operations.
- f. Supervisors who oversee the daily activities of workers who wear respirators should be familiar with the following:
- $\frac{3}{4}$ Work requirements and conditions necessitating the use of respirator protective equipment. These may include:
 - Time of exposure to a contaminant
 - The activity and mobility of the worker
 - Eye protection needed

- Temperature extremes
 - Face piece-to-face seal of various types of equipment
- ¾ Nature and extent of hazards to which a worker may be exposed.
- Type of contaminant and its concentration
 - Acute (short term) or chronic (long term) exposure potential
- ¾ The general operation of the process; maintenance and inspection of equipment, issuance of respirators, and control of their use.
- ¾ Legal requirements pertinent to the use of respirators in a capacity as supervisor.
- g. A Supervisor can get help and information from the Respirator Training Guide, Material Safety Data Sheets, or the Safety Director.
- h. Since the worker will be directly exposed to contaminants, he/she must know:
- ¾ The nature of the hazard and what might happen if a selected respirator is not worn.
 - ¾ What control measures are being considered in addition to wearing personal protective equipment?
 - ¾ Why a particular respirator was selected for that job.
 - ¾ The limitations of a specific respirator.
 - ¾ How to use any respirator assigned to him/her and to adjust the unit for a proper fit.
 - ¾ Maintenance, storage and cleaning of respirators.
 - ¾ How to recognize an emergency and use the proper equipment.
- i. The supervisor will provide training with help from the Safety Director.
- j. The most effective respiratory protective equipment is that equipment which is worn. The best way to insure that the respirators will be worn is to handle objections to wearing the equipment.
- k. The worker must be motivated to wear the respirator by instilling in him the desire and need to wear the proper equipment. If objections to fit, size, type, etc., are handled, then there will be a greater likelihood that the worker will wear the respirator provided.

25. PROCESS EVALUATION

- a. NSE shall conduct evaluations of the jobsite to ensure that the written respiratory protection process is being properly implemented, and to consult employees to ensure that they are using the respirators properly.
- b. NSE shall conduct evaluations of the jobsite as necessary to ensure that the provisions of the current written process are being effectively implemented and that it continues to be effective.
- c. NSE shall regularly consult employees required to use respirators to assess the employees' views on process effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:
 - $\frac{3}{4}$ Respirator fit (including the ability to use the respirator without interfering with effective jobsite performance)
 - $\frac{3}{4}$ Appropriate respirator selection for the hazards to which the employee is exposed
 - $\frac{3}{4}$ Proper respirator use under the jobsite conditions the employee encounters; and
 - $\frac{3}{4}$ Proper respirator maintenance

26. RECORDKEEPING

- a. NSE shall establish and retain written information regarding medical evaluations, fit testing, and the respirator process. This information will facilitate employee involvement in the respirator process, assist the employer in auditing the adequacy of the process, and provide a record for compliance determinations by OSHA.
- b. Records of medical evaluations required by this section must be retained and made available in accordance with 29 CFR 1910.1020.
- c. The employer shall establish a record of the qualitative and quantitative fit tests administered to an employee including:
 - $\frac{3}{4}$ The name or identification of the employee tested
 - $\frac{3}{4}$ Type of fit test performed
 - $\frac{3}{4}$ Specific make, model, style, and size of respirator tested
 - $\frac{3}{4}$ Date of test; and

- ³/₄ The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.
- d. Fit test records shall be retained for respirator users until the next fit test is administered.
 - e. A written copy of the current respirator process shall be retained by the Safety Director.
 - f. Written materials required to be retained under this process shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

RIGGING AND HOISTING

1. PURPOSE

This policy is intended as a guide for the safe rigging and hoisting operations.

2. SCOPE

This policy applies to projects where rigging and hoisting operations are performed by:

A. NextSun Energy, LLC (NSE)

B. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management

C. All NextSun Energy, LLC, contractors, sub contractors, and their workers, while working under NextSun Energy, LLC contracts

3. KEY PRECAUTIONS

A. Find the load weight before lifting.

B. Allow for unknown factors when figuring the available capacity of the equipment being used.

Note: Finding Load Weight – Get it from shipping papers, design plans, catalog data, name plates, or other reliable sources. If not available from these sources, calculate it yourself.

4. LIMITATIONS

A. Do not exceed the safe working load limits of the equipment and tackle being used.

B. Check supporting members for chain falls, etc. before using to ensure adequate strength for the load.

D. Do not assume a multi legged bridle sling will safely lift a load equal to the safe load on one leg multiplied by the number of legs.

5. PROCEDURES

A. Inspect slings before use. Discard damaged slings.

B. Use only certified or approved chains, slings, or spreaders.

C. Do not bend wire rope slings near the eye or an attached fitting.

D. Do not kink sling legs.

E. Store all hoisting and rigging equipment in a cool dry place and avoid contact with direct sunlight.

F. Rigging equipment will be removed from the work area when not in use. Rigging equipment must be placed in an area that prevents damage to the equipment as well as creating a hazard to the employees.

- G. If placing two or more eyes over a non-latching hook, install a shackle on the hook with the shackle pin resting in the hook and hook the rope eye to the shackle.
- H. Do not shorten slings with knots, bolts, or other makeshift devices.
- I. Balance loads on slings used in a basket hitch to prevent slipping.
- J. Pad or protect slings from the sharp edges of their loads.
- K. When working near energized electrical equipment, ground the rigging and maintain proper clearance.
- L. Equip all portable hoisting equipment with safety latches for the hook.
- M. Do not paint cables, slings, and associated hardware unless approved by the manufacturer.
- N. Keep corrosive material away from cables and slings.

6. **WIRE ROPE**

- A. Do not load wire rope over its working capacity.
- B. Check wire rope for proper installation according to manufacturer recommendations.

7. **WELDING**

- A. Do not use the chain or wire rope as a ground when welding.
- B. Never touch a live welding electrode to the chain or wire rope.

8. **SLING ANGLE**

- A. Ensure the sling angle is always over 45° when possible.
- B. Once a load is rigged, check that the horizontal distance between the attachment points of the load is less than the length of the shortest sling leg.

9. **DAMAGED EQUIPMENT**

- B. Before using, check hardware, equipment, tackle, and slings. Destroy defective parts.
- C. Safe working load limits apply only to equipment in good condition, undamaged, and with non-kinked structural members. Do not use damaged equipment.
- D. When using a choker hitch, do not force the eye down toward the load once tension is applied. Rope damage will result.
- E. Do not try to lengthen or repair damaged load chain.

10. **PERSONNEL REQUIREMENTS FOR HOISTING**

- B. Do not allow an unqualified person to operate a hoist.

- C. Be sure all persons are clear before lifting or transporting a load.
- D. Do not carry persons on the hook or load.
- E. Do not divert attention from the load while operating the hoist.

11. PROCEDURES

- A. Work within the limits of the hoist.
- B. Do not place your hands or fingers between the sling and its load while the sling is being tightened around the load.
- C. Avoid sharp contact between two hoists, hoist and end post, and hooks and hoist body.
- D. Do not tamper with any part of the hoist.
- E. Never use the hoist chain or rope wire as a sling.
- F. When working with rigging equipment under tension, position yourself to minimize the potential of being struck by a cable or other rigging equipment if it fails.
- G. Do not shock-load. Example: pinching off or dropping load on a slack sling. Jerking will cause loading far in excess of static load.

12. LIMITATIONS

Do not operate the hoist at the extreme limits.

13. SUSPENDED LOADS

- A. Never leave a suspended load unattended.

Keep suspended loads clear of obstructions when possible

NEXTSUN ENERGY, LLC

Scaffold Safety Process

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NEXTSUN ENERGY, LLC

Scaffold Safety Process

1. **PURPOSE**

The purpose of this process is to provide directions and instructions for NextSun Energy, LLC requirements to be implemented with the construction, erection, and dismantling of scaffolds and ladders.

2. **SCOPE**

The scope of this process applies to all jobsite locations where scaffolds and ladders may be used. The requirements, as set forth in this process, should be implemented to the fullest extent possible and utilized by:

- a. NextSun Energy, LLC (NSE)
- b. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- c. All NextSun Energy, LLC (NSE), contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **REFERENCE**

29 CFR 1926 Subpart L

4. **RESPONSIBILITIES**

- a. The primary responsibility for the implementation of the requirements of this process shall rest with the Site Supervisor.
- b. NSE Safety Director or designee shall be responsible to provide for the monitoring of work activities to assure compliance to the requirements of this process and compliance to the Customer/Client safety requirements.
- c. The Site Supervisor and NSE management shall be responsible for the enforcement and disciplinary action resulting from violation or failure of assigned persons to implement the requirements of this process.

5. REQUIREMENTS

- a. A competent person shall ensure that scaffolds are safe prior to and during use.
- b. If unsafe equipment or conditions are observed, these shall be tagged out by the competent person. All employees shall comply with the tagout. Scaffolding that is tagged out as being unsafe shall not be used.
- c. Only qualified and competent personnel are allowed to modify scaffolding systems. Non-qualified personnel may create hazards and unsafe situations and are therefore prohibited from attempting to modify a scaffolding system.
- d. The following requirements are applicable to all scaffolds:

$\frac{3}{4}$ Guardrails and Toeboards:

- Guardrails shall be constructed of 2" X 4" lumber, 1/2 inch wire rope, angle iron or the prefabricated rail(s) supplied by the scaffold manufacturer.
- Toprails shall be approximately 42 inches above the working surface.
- Midrails shall be approximately 21 inches above the working surface.
- Wire rope toprails and midrails shall be stretched tight with no more than an approximate 2 inch deflection.
- Toeboards shall extend a minimum of 4 inches above the working surface.
- When the placement of the scaffold work platform prevent the installation of guardrails, other fall protection equipment shall be used.
- Guardrails and toeboards shall be installed on all open sides and ends of scaffolds.
- Scaffolds and work platforms 4 feet to 10 feet high with a working surface of less than 45 inches shall have standard guardrails installed on all open sides and ends of the scaffold or platform.

$\frac{3}{4}$ Working Surfaces:

- Working surfaces shall be constructed of scaffold plank, aluminum deck boards or 3/4" construction grade plywood.
- Scaffold planking shall be scaffold grades or equivalent as recognized by approved grading rules for the species of wood used under the American Lumber Standards.
- Working surfaces shall be secured by nails, double wrap of #9 wire or cleats.

- Lumber sizes, when used in this process, refer to nominal size/thickness except where otherwise stated.
- Scaffold planks shall extend a minimum of 6 inches and a maximum of 12 inches over the end supports.
- If required, an access/egress ladder shall be provided.
- Scaffold planks shall not span more than 8 feet between supports/vertical legs.
- Scaffold planks and plywood shall be free of splits and burns.

³/₄ Scaffold Footing and Anchorage:

- The footing or anchorage shall be capable of carrying the maximum intended load without settling or displacement.
- The uprights/vertical legs shall be plumb and securely braced to prevent swaying and displacement.

NOTE: The requirements for specific types of scaffolds and ladders are described below.

³/₄ Tubular Welded Frame:

- Scaffold shall be cross-braced to assure scaffold is plumb, square, and rigid.
- Stacking pins shall only be secured with the manufacturer's pins or recommended bolts.
- Cross braces shall be secured, as designed by the manufacturer.
- Stationary scaffolds must be secured horizontally, every 26 feet of height and 30 feet horizontally, to prevent tipping.
- The height of rolling scaffolds, measured from the ground to the toprail, shall be no more than four times the minimum base dimension (length times the width).
- All wheels/casters shall be the same size, equipped with a positive locking device, and in good working condition.
- Wheels shall be locked while personnel are working from the scaffold.
- Personnel shall not be permitted on mobile scaffold while the scaffold is being moved.

³/₄ Tube and Coupler (Tube-Lock):

- Uprights shall have a maximum spacing of 8 feet.
- Uprights shall be placed on secure bases and maintained plumb.
- Scaffolds shall be limited in heights and working levels to those permitted in Tables 2-10, 11, and 12 of OSHA 29 CFR 1926.451.
- Horizontal braces shall be installed completely around all exterior uprights and between interior uprights. Braces shall be installed every 6 feet of height.
- Platform supports shall be coupled/clamped directly to the horizontal braces and extend 4 inches to 12 inches beyond the horizontal braces.
- All horizontal bracing shall be coupled/clamped directly to the uprights.
- Diagonal bracing shall be installed at alternating 45 degree angles beginning with the corner upright and repeating every 5th upright on the perimeter. An alternating bracing pattern should be used.

³/₄ One and Two Point Suspension Scaffolds:

- Cable shall be securely anchored and softeners shall be used when necessary.
- Cable shall be insulated at the anchor point from the motor to 4 feet above the motor and wherever the cable comes in contact with metal to prevent electrical arcing.
- Two-point suspension scaffold platforms shall remain level while being raised or lowered.
- Each employee shall wear a full body harness and be tied off to an independent lifeline. A lifeline shall be supplied for each employee.

³/₄ Knee Brace/Cantilever:

- Knee brace/cantilever scaffolding shall be welded by a qualified welder and visually inspected before use.

³/₄ Ladders:

- Ladders shall extend 36 inches above the landing.
- Extension and job-built ladders shall be secured to prevent movement or falling.

- Manufactured ladders shall be Class I or Class IA with properly working feet.
- The slope of the ladder from the base of the support shall be one (1) foot for every four (4) feet of ladder length.
- All ladders shall be set on a firm base to prevent shifting and tipping.
- Ladders with broken or missing rungs or steps, broken or split side rails, or faulty or defective construction, shall not be used.
- Metal ladders shall not be used.
- Step ladders shall not be used as a leaning ladder.
- Employees shall not work off the top two steps of a stepladder.
- Personnel shall have both hands free of tools, materials, or equipment, while climbing and descending ladders.
- Personnel shall face the ladder when climbing and descending.

6. TRAINING REQUIREMENTS

- a. NSE shall have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training shall include the following areas, as applicable:
 - $\frac{3}{4}$ The nature of any electrical hazards, fall hazards and falling object hazards in the work area;
 - $\frac{3}{4}$ The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used;
 - $\frac{3}{4}$ The proper use of the scaffold, and the proper handling of materials on the scaffold;
 - $\frac{3}{4}$ The maximum intended load and the load-carrying capacities of the scaffolds used; and
 - $\frac{3}{4}$ Any other pertinent requirements.
- b. NSE shall have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold trained by a competent person

to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable:

- ¾ The nature of scaffold hazards
 - ¾ The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question
 - ¾ The design criteria, maximum intended load-carrying capacity and intended use of the scaffold
 - ¾ Any other pertinent requirements
- c. When NSE has reason to believe that an employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, NSE shall retrain each such employee so that the requisite proficiency is regained. Retraining is required in at least the following situations:
- ¾ Where changes at the worksite present a hazard about which an employee has not been previously trained; or
 - ¾ Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or
 - ¾ Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.
- d. The Site Supervisor shall be responsible for implementing the employee training and information process. The format for the process may include classroom instruction, safety tool box meetings, and other forms of group or singular instructions.
- e. Instructions are normally communicated verbally or in writing through the employee's Supervisor. The Site Supervisor is responsible for assuring Supervisors are qualified or competent in the following areas:
- ¾ Fall hazards and falling object hazards
 - ¾ Electrical hazards (protection from electrical hazards for erecting, maintaining, and dismantling)
 - ¾ Fall protection and protection systems
 - ¾ Proper and safe handling of materials
 - ¾ Trained in the maximum intended loads and load-carrying capacities
 - ¾ Any other pertinent requirements

All NextSun Energy, LLC employees will be trained in the above mentioned, along with any additional basic or site requirements

NextSun Energy, LLC will insure that each employee follows the safety guidelines as set forth in Safe Work Practices

NEXTSUN ENERGY, LLC
SCAFFOLDING INSPECTION REPORT

Date: _____

Time: _____ : _____

Job No: _____ . Client: _____

Scaffold Location: _____ Inspected by: _____

NOTE: Scaffold shall not be used unless these items are found satisfactory.

SECTION 1.

Yes/No	Comments
1. _____	Base plates/screw jacks on firm contact with sills/deck to prevent settling. _____
2. _____	Scaffold appears to be level and verticals are plumb. _____
3. _____	Safe, proper access and egress provided to all work platforms. _____
4. _____	All platforms properly/tightly planked and secured from movement. _____
5. _____	All toeboards secured in place. _____
6. _____	All guardrails and midrails in place. _____
7. _____	Are vertical legs rigidly braced to prevent swaying. _____
8. _____	Scaffold anchored or equalized (4 to 1) to prevent movement (butts/ties installed). _____
9. _____	No energized, unprotected electrical is within 12 feet of the scaffold. _____
10. _____	Has the scaffold been tagged and has not been altered. _____

SECTION 2.

- | Yes/No | Comments |
|---------------|--|
| 1. | Scaffold planks construction grade lumber and in good condition.
_____ |
| 2. | Are all planking and toeboards in place and secured.
_____ |
| 3. | All guardrails and midrails in place and secured.
_____ |
| 4. | All tools and material raised and lowered to locations just carried by employees.
_____ |
| 5. | Working platforms clear of all loose tools, cords, material, etc.
_____ |
| 6. | Exit ways and ladders clear and unobstructed.
_____ |
| 7. | Stair and planks free of debris or slippery surface.
_____ |
| 8. | Work being performed on the scaffold in accordance with load ratings.
_____ |
| 9. | Have barricades been installed, scaffold tags been placed properly.
_____ |

Inspector: _____
Print

Sign

Supervisor: _____
Print

Sign

Scaffold Size: _____

NOTES: _____

DANGER

KEEP OFF

DO NOT USE THIS SCAFFOLD

This scaffold is being erected, taken
do\Nn or has been found to be defective.

Scaffold Erected by:

Date Erected:

TOOLS

1. PURPOSE

This policy is intended as a guide for the safe use and care of tools.

2. SCOPE

This policy applies to all projects where tools are required by:

A. NextSun Energy, LLC (NSE)

B. All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management

C. All NextSun Energy, LLC, contractors, sub contractors, and their workers, while working under NextSun Energy, LLC contracts

3. CONDITION OF TOOLS

All hand tool and portable power tools and similar equipment, whether furnished by the employer or the employee, will be maintained in a safe condition. Tools will be stored in appropriate storage areas when not in use.

4. ELECTRIC-POWERED TOOLS

Electric power tools will be either three-wire grounded or double-insulated.

5. HAND TOOL SAFETY PRACTICES

A. Floors will be kept as clean and dry as possible to prevent accidental slips when using hand tools.

B. Tools with rotating blades, knives, and other sharp tools will be directed away from employees working in close proximity.

C. Knives and blades will be kept sharp.

D. Spark-resistant tools will be used around flammable substances.

6. POWER TOOL SAFETY PRACTICES

To prevent hazards associated with the use of power tools, employees will obey the following general precautions:

A. Never carry a tool by the cord.

B. Never yank the cord to disconnect it from the receptacle.

C. Keep cords away from heat, oil, and sharp edges.

D. Disconnect tools when not using them and when changing accessories such as blades, bits, and cutters.

E. Secure work if possible to allow hands free operation.

- F. Refer to user’s manual for lubricating and changing accessories.
- G. Do not wear loose clothing or jewelry when operating portable power tools.
- H. Remove all damaged or defective tools from use and tag them: “Do Not Use.”
- I. Always use a GFCI when using hand-held electric tools.

7. GUARDING PORTABLE POWER TOOLS

- A. All power tools designed with guards will be equipped with such guards when in use. All belts, gears, shafts, sprockets, drums, spindles, fly wheels, chains, pulleys, or other reciprocating, rotating, or moving parts of tools will be guarded.
- B. Following are general safe work practices when working with power tools with guards:
 - i. Guards will not be removed unless the power tool is unplugged or locked out.
 - ii. Do not use unauthorized or damaged guards.
 - iii. Never leave tools unattended with parts still moving.
 - iv. Never remove or bypass guards.
 - v. Keep the work area free of debris.
 - vi. Wear proper eye and face protection while operating power tools.
 - vii. Never wear loose clothing or jewelry while operating power tools.

8. SPECIFIC HAND AND PORTABLE POWER TOOLS

A. Hand Tools

Wrenches including adjustable, pipe, box-end, and socket-style wrenches will not be used when the jaws or socket are stripped or sprung in such a way that slippage occurs.

Impact tools such as drill pins or punches, wedges, and chisels will be kept free of mushroomed heads.

Wooden-handled tools will be kept free of cracks and splinters and will be kept tightly attached.

B. Circular saws

- i. Circular saws will be equipped with guards above and below the base plate or shoe.
- ii. Circular saws will be equipped with a constant pressure switch.

C. Portable Power Grinders

- i. When using a powered grinder, employees must:
 - Always use eye protection.
 - Turn off the power when not in use.
 - Never clamp a hand-held grinder in a vise.

- ii. **Guards.** Portable grinding tools will be equipped with safety guards.
- iii. Inspect abrasive before using.
- iv. Operate within the rated speed of the wheel.

D. Electric Power-Operated Tools

- i. Portable electric power-operated tools will be of the approved double-insulated type.
- ii. **Safe work practices.** Employees will implement the following safe work practices when handling and operating electric power-operated tools:
 - Never use electrical cords for hoisting or lowering tools.
 - Keep cords away from heat, oil, and sharp edges.
 - Operate electrical tools only within their design limitations.
 - Wear gloves and safety footwear as appropriate.
 - When not in use, store electrical tools in a dry place.
 - Do not use electrical tools in damp or wet locations without authorization.
 - Ensure work areas are well-lighted.

E. Pneumatic-Powered Tools and Hoses

Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders.

- i. **Retainer.** Pneumatic power tools will be secured to the hose with a retainer to prevent accidental disconnect.
- ii. **PPE.** Eye protection is required.
- iii. **Air pressure.** The safe operating pressure stated by the manufacturer will not be exceeded. Supplied compressed air will not be used for cleaning purposes except when reduced to 30 pounds per square in.
- iv. **Nailers, staplers, and similar tools.** Will have a safety tip to prevent inadvertent firing.

F. Hydraulic Power Tools

- i. Stay within Pressure Ratings.
 - a. Do not exceed the pressure rating of a hydraulic hose, valve, pipe filter, or other fitting.
 - b. Do not use a radiator type hose clamp.
- iii. Non-conductive Hoses must be used around electrically energized lines or equipment.
- iv. The fluid used in hydraulic powered tools will be fire-resistant.
- v. Leak – Do not use your body to locate or stop a hydraulic leak.
- vi. Maintenance or Repairs – Only a certified employee should do them for a hydraulic tool or hose.
- vii. Hydraulic Pruners & saws - Inspect daily before using and disconnect hoses before adjusting or sharpening.
 - a. Hydraulic Pruner - When aloft and not in use secure in boom mounted Pruner holder with cutting hook no higher than actuating handle.
 - b. Hydraulic Saw:
 - ¾ Start all cuts with two-handed control

- $\frac{3}{4}$ When practical, use two-handed control
- $\frac{3}{4}$ When aloft and not in use, secure in scabbard

G. Powder-Actuated Tools

Powder-actuated tools are actuated by explosives or any similar means, and propel a stud, pin, fastener, or other object for the purpose of affixing it by penetration to any other object.

- i. **Employee training.** Only employees who have been trained in the safe operation of the particular powder-actuated tool in use will be allowed to operate a powder-actuated tool.
- ii. **Testing.** The tool will be tested each day before loading to see that safety devices are in proper working condition. The method of testing will be in accordance with manufacturer's recommended procedures.
- iii. **Inspection.** Before using a tool, the operator will inspect it to determine to his or her satisfaction that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions. The tool will be inspected at regular intervals and be repaired in accordance with the manufacturer's specifications.
- iv. **Safe work practices.** Employees will obey the following safe work practices when operating powder-actuated tools:
 - Any tool found not in proper working order, or which develops a defect during use, will be immediately removed from service and not used until properly repaired by an authorized provider.
 - Tools will not be loaded until just prior to the intended firing time. At no time, loaded or unloaded, are the tools to be pointed at any employees.
 - Hands will be kept clear of the open barrel.
 - Loaded tools will not be left unattended.
 - Tools will not be used in an explosive or flammable environment.
 - In case of a misfire, the operator will hold the tool in the operating position for at least 30 seconds and then try to operate the tool a second time. The operator will wait another 30 seconds, holding the tool in the operating position, then proceed to remove the explosive load in strict accordance with the manufacturer's instructions.
 - A tool will never be left unattended in a place where it would be available to unauthorized persons.
 - Fasteners will not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.
 - Driving into materials easily penetrated will be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying-missile hazard on the other side.
 - Fasteners will not be driven directly into materials such as brick or concrete closer than 3 in. from the unsupported edge or corner or into steel surfaces closer than $\frac{1}{2}$ in. from the unsupported edge or corner, unless a special guard, fixture, or jig is used. (Exception: Low-velocity tools may drive no closer than 2 in. from an edge in concrete or $\frac{1}{4}$ in. in steel).
 - When fastening other materials, such as a 2- by 4-in. wood section to a concrete surface, it is permissible to drive a fastener of no greater than $\frac{7}{32}$ -in. shank diameter not closer than 2 in. from the unsupported edge or corner of the work surface.
 - Fasteners will not be driven through existing holes unless a positive guide is used to secure accurate alignment.
 - No fastener will be driven into a spalled area caused by an unsatisfactory fastening.
 - Driving into materials easily penetrated will be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

- v. **Protective systems and PPE.** All tools will be used with the correct shield, guard, or attachment recommended by the manufacturer. Appropriate PPE will be used when operating powder-actuated tools. Eye protection will be required at all times. Head and face protection will be used as required by working conditions.

H. Jacks

A jack is an appliance for lifting and lowering or moving horizontally a load by application of a pushing force. Jacks may be lever and ratchet, screw, and hydraulic.

The manufacturer's rated capacity for the jack will be legibly marked on all jacks and will not be exceeded. All jacks will have a positive stop to prevent and stop over-travel.

When providing a firm foundation, the jack base, as well as the cap, will be blocked or cribbed to prevent slippage. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load.

- i. **Inspections.** Jacks will be maintained according to the manufacturer's recommendations and inspected at least every 6 months and prior to use. For jacks subjected to abusive conditions such as freezing, load shock, or extreme heat, the jack will be examined for possible defects.
- ii. **Defective jack.** Any jack found damaged or defective will be tagged accordingly and not be used until repaired by a person qualified to perform such repairs.

9. ENGINE DRIVEN SAWS AND DRILLS

A. Before Using

- i. Read the Operators Manual.
- ii. Inspect the tool.
- iii. Wear proper personal protective equipment.
- iv. Clear working space of obstacles to prevent trips, falls, and accidental cutting edge contact.

B. When starting

- i. Do not start within 10 feet of fueling location.
- ii. Ensure all persons in the area are in the clear.

C. When engine is running

- i. Have secure footing and two-handed control of the tool.
- ii. Be sure all persons in the area are clear.
- iii. Do not send a power-actuated drill or saw aloft.

D. When working aloft, secure the tool by a separate work rope attached to the boom strap/ring/handline or tree.

E. When not using, stop the engine.

F. When refueling

- i. Do not run the engine.

- ii. Do not smoke.
- ii. Stay away from open flames.
- iv. If engine is hot, let engine cool down.

G. Servicing

- i. Adjust so the chain or bit completely stops when the trigger or throttle is released.
- ii. If a saw has a direct-drive blade, disconnect the spark plug before servicing.

10. CHAINSAWS

A. Carry by top handle with guide bar to the rear.

B. Starting

- i. Use extra care when starting a saw while aloft.
- ii. Do not drop start the saw while on the ground.

C. When operating the saw

- i. Avoid holding saw above your shoulder height.
- ii. Grasp the saw securely with your thumb and fingers in opposing direction around the handle(s).
- iii. Wear protective chaps when operating at ground level.

D. Persons in the area

- i. Wear protective chaps if within 6 feet of the saw.
- ii. When brushing, stay at least 6 feet from the saw being operated.

E. Chain Tension - Maintain proper tension on the saw bar. See the manufacturer's recommendations.

11. BRUSHSAWS

A. Starting

- i. Ensure cutting blade rotates freely and is free of objects.
- ii. Put on level ground and hold securely.

B. Operating the saw

- i. Keep persons in the area at least 30 feet from the cutting head.
- ii. Wear a shoulder support harness.

C. Blades

- i. Use only manufacturer's recommended cutting blades.

- ii. Do not use cracked, dull, or damaged blades.
- iii. Protect edge of cutting blade when not in use.

12. **MOWERS AND SNOW THROWERS**

A. Power Lawn Mowers - Push

- i. **Before mowing**
 - a. Read the Operators Manual.
 - b. Remove any rocks, wire or other foreign objects from mowing area.
- ii. **When mowing**
 - a. Wear appropriate personal protective equipment like safety glasses, sturdy footwear, (work shoes or boots), hardhat, and hearing protection.
 - b. Avoid putting any part of body in front of the discharge opening.
 - c. Where possible, avoid pulling the mower backward.
 - d. **For a slope** (see Glossary) over 4/12, mow across the face.
EXCEPTION: Use a rope to raise and lower the mower while standing at the top of the slope.
- iii. **Before servicing or inspecting**
 - a. Shut off the mower and let the blade stop.
 - b. Disconnect the spark plug wire or move ignition key.

B. Power Lawn Mowers - Riding

- i. **Before mowing**
 - a. Read the Operators Manual.
 - b. Remove any rocks, wire or other foreign objects from mowing area.
- ii. **When operating**
 - a. Do not engage mower blades unless seated on the mower.
 - b. Do not mow across a slope of more than 4/12 or up/down a slope over 6/12.
- iii. **Before servicing or inspecting**
 - a. Shut off the mower and let the blade stop.
 - b. Disconnect the spark plug wire or move ignition key.

C. Snow Throwers

- i. Before Removing Snow**
 - a.** Read the Operators Manual.
 - b.** Remove hazardous debris from the area to be cleared of snow before starting the engine.
- ii. Removing Snow in graveled area,** put the snow thrower in its highest operating position.
- iii. Maintenance** - Before clearing the discharge chute or doing other maintenance, TURN OFF THE IGNITION key, if applicable or disconnect the spark plug wire.

NEXTSUN ENERGY, LLC

Hot Work Welding, Burning and Cutting Process

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NEXTSUN ENERGY, LLC

Hot Work Welding, Burning and Cutting Process

1. **PURPOSE**

This policy is intended as a guide for the safe use of welding and burning equipment.

2. **SCOPE**

This policy applies to job sites where hot work, welding, burning and cutting are accomplished by:

- ¾ NextSun Energy, LLC (NSE)
- ¾ All new, transferred or rehired employees as well as temporary help under the direct day to day supervision of NextSun Energy, LLC management.
- ¾ All NextSun Energy, LLC, contractors, sub contractors, their workers and suppliers, while working under NextSun Energy, LLC contracts.

3. **REFERENCES**

29 CFR 1910 Subpart Q

4. **GENERAL**

"Hot work" means riveting, welding, flame cutting or other fire or spark-producing operation.

- a. Only properly trained and instructed employees shall be permitted to use electric, oxygen and fuel gas welding, burning and cutting equipment. Supervisors shall also be trained in these safety requirements so that they can effectively oversee, manage and enforce safe work operations.

- b. Employees shall be protected from radiant energy eye hazards by spectacles, cup goggles, helmets, hand shields or face shields with filter lenses. Filter lenses shall have an appropriate shade number, as indicated in the following table for the work performed. Variations of one or two shade numbers are permissible to suit individual preferences.

FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY

Operation	Shade No.
Soldering	2
Torch Brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1-6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Light gas welding, up to 1/8"	4 or 5
Medium gas welding, 1/8 – 1/2"	5 or 6
Heavy gas welding, over 1/2"	6 or 8
Shielded Metal-Arc Welding 1/16 to 5/32 - inch electrodes.	10
Inert-gas Metal-Arc Welding (Non-ferrous) 1/16 - to 5/32 - inch electrodes.	11
Shielded Metal-Arc Welding: 3/16 to 1/4 - inch electrodes	12
5/16 - and 3/8 - inch electrodes	14

- c. Authorization from the Site Supervisor or, in the shop, the supervisor in charge, before cutting or welding is permitted. The area where hot work will be performed shall be inspected by the Site Supervisor or the supervisor in charge. The supervisor shall designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.
- d. To the extent possible, hot work shall be performed in designated locations that are free of hazards.
- e. Hot work shall not be performed in flammable or potentially flammable atmospheres, on or in equipment or tanks that have contained flammable gas or liquid or combustible liquid or dust-producing material, until a designated person has tested the atmosphere inside the equipment or tanks and determined that it is not hazardous.
- f. Regarding fire hazards, if the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.
- g. When hot work must be performed in a location that is not free of fire hazards, all necessary precautions shall be taken to confine heat, sparks, and slag so that they cannot contact flammable or combustible material. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat sparks and slag and to protect the immovable fire hazards.

- h. If the safety requirements specified in this program cannot be followed, then welding and cutting shall not be performed until it can be done safely and in compliance with company safety rules.
- i. Drums and containers which contain or have contained flammable or combustible liquids shall be kept closed. Empty containers shall be removed from the hot work area.
- j. Inspect all leads torches, hoses, gauges and other equipment daily before use.
- k. The operator should report any equipment defect or safety hazard to his supervisor and the use of the equipment shall be discontinued until its safety has been assured. Repairs shall be made only by qualified personnel.
- l. Always check around and below before commencing hot work operations. Use blankets or other protective devices where required. Cover electrical wires to prevent damage.
- m. Wear an approved respirator or assure some means of local exhaust ventilation when performing hot work in an area subject to accumulation of fumes and vapor. When in doubt, ask the Site Safety Supervisor/Representative for assistance. Any employee exposed to the same atmosphere as the welder or burner shall be protected by the same type of respiratory and other protective equipment as that worn by the welder or burner.
- n. Hot work activities requiring local ventilation and/or respirators include:
 - $\frac{3}{4}$ Zinc bearing base or filler metal or metals coated with zinc bearing materials.
 - $\frac{3}{4}$ Lead based metals; metals containing lead other than as an impurity or metals coated with lead bearing materials.
 - $\frac{3}{4}$ Cadmium bearing filler materials; or cadmium coated base materials.
 - $\frac{3}{4}$ Chromium bearing metals or metals coated with chromium bearing materials.
 - $\frac{3}{4}$ Beryllium containing base or filler metals. Because of its high toxicity, work involving beryllium shall be done with both local exhaust ventilation and air supplied respirators.
 - $\frac{3}{4}$ Adequate spark containment methods or barricades shall be used when welding burning or cutting overhead.
 - $\frac{3}{4}$ Never heat an object lying flat on a concrete floor. Be sure to provide an air space between the material and the floor, as concrete will explode under extreme heat.

5. ELECTRIC ARC WELDING AND CUTTING

- c. Personnel designated to operate arc welding equipment shall have been properly instructed and qualified to operate such equipment. Personnel assigned to operate or

maintain arc welding equipment shall be acquainted with both company safety rules and OSHA requirements under Part 1910 Subpart Q - Welding, Cutting, and Brazing.

- d. Personnel performing gas-shielded arc welding shall comply with Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.
- e. All work shall have a separate and adequate ground.
- f. Welding leads shall not be placed in aisles, stairways or landings where they will present tripping hazards. Excessive leads and hoses should be avoided.
- g. Only manual electrode holders intended for arc welding and cutting and capable of handling the maximum current required for such welding or cutting shall be used.
- h. Current-carrying parts passing through those portions of the holder gripped by the user and through the outer surfaces of the jaws of the holder shall be insulated against the maximum voltage to ground.
- i. Arc welding and cutting cables shall be insulated, flexible and capable of handling the maximum current required by the operations, taking into account the duty cycles.
- j. Only cable free from repair or splice for 10 feet (3 m) from the electrode holder shall be used unless insulated connectors or splices with insulating quality equal to that of the cable are provided.
- k. Insulated connectors of equivalent capacity shall be used for connecting or splicing cable. Cable lugs, where used as connectors, shall provide electrical contact. Exposed metal parts shall be insulated.
- l. Ground return cables shall have current-carrying capacity equal to or exceeding the total maximum output capacities of the welding or cutting units served.
- m. Arc welding and cutting machine frames shall be grounded, either through a third wire in the cable containing the circuit conductor or through a separate wire at the source of the current. Grounding circuits shall have resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.
- n. When electrode holders are left unattended, electrodes shall be removed and holders placed to prevent employee injury.
- o. Hot electrode holders shall not be dipped in water.
- p. When arc welders or cutters leave or stop work or when machines are moved, the power supply switch shall be kept in the off position.
- q. Arc welding or cutting equipment having a functional defect shall not be used.

- r. Arc welding and cutting operations shall be separated from other operations by shields, screens, or curtains to protect employees in the vicinity from the direct rays and sparks of the arc.

6. GAS WELDING AND CUTTING

a. Compressed gas cylinders:

- $\frac{3}{4}$ Shall have valve protection caps in place except when in use, hooked up or secured for movement. Oil shall not be used to lubricate caps
- $\frac{3}{4}$ Shall be hoisted only while secured, as on a cradle or pallet, and shall not be hoisted by mallet, choker sling or cylinder caps
- $\frac{3}{4}$ Shall be moved only by tilting or rolling on their bottom edges
- $\frac{3}{4}$ Shall be secured when moved by vehicle
- $\frac{3}{4}$ Shall be secured while in use
- $\frac{3}{4}$ Shall have valves closed when cylinders are empty, being moved or stored
- $\frac{3}{4}$ Shall be secured upright except when hoisted or carried
- $\frac{3}{4}$ Shall not be freed when frozen by prying the valves or caps with bars or by hitting the valve with a tool
- $\frac{3}{4}$ Shall not be thawed by boiling water
- $\frac{3}{4}$ Shall not be exposed to spark, hot slag, or flame
- $\frac{3}{4}$ Shall be kept away from radiators and other sources of heat
- $\frac{3}{4}$ Shall not be permitted to become part of electrical circuits or have electrodes struck against them to strike arcs
- $\frac{3}{4}$ Shall not be used as rollers or supports
- $\frac{3}{4}$ Shall not have contents used for purposes not authorized by the supplier
- $\frac{3}{4}$ Shall not be used if damaged or defective

- ¾ Shall not have gases mixed within, except by gas suppliers
 - ¾ Shall be stored so that oxygen cylinders are separated from fuel gas cylinders and combustible materials by either a minimum distance of 20 feet (6 m) or a barrier having a fire-resistance rating of 30 minutes
 - ¾ Shall not have objects that might either damage the safety device or obstruct the valve placed on top of the cylinder when in use
- b. Fuel gas shall be used only as follows:
- ¾ Before regulators are connected to cylinder valves, the valves shall be opened slightly (cracked) and closed immediately to clear away dust or dirt. Valves shall not be cracked if gas could reach possible sources of ignition
 - ¾ Cylinder valves shall be opened slowly to prevent regulator damage and shall not be opened more than 1 1/2 turns. Any special wrench required for emergency closing shall be positioned on the valve stem during cylinder use. For manifolded or coupled cylinders, at least one wrench shall be immediately available. Nothing shall be placed on top of a cylinder or associated parts when the cylinder is in use.
 - ¾ Pressure-reducing regulators shall be attached to cylinder valves when cylinders are supplying torches or devices equipped with shut-off valves
 - ¾ Cylinder valves shall be closed and gas released from the regulator or manifold before regulators are removed
 - ¾ Leaking fuel gas cylinder valves shall be closed and the gland nut tightened. If the leak continues, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous. If a regulator attached to a valve stops a leak, the cylinder need not be removed from the workplace but shall be tagged and may not be used again before it is repaired
 - ¾ If a plug or safety device leaks, the cylinder shall be tagged, removed from service, and moved to a location where the leak will not be hazardous
- c. Fuel gas and oxygen hoses shall be easily distinguishable from each other by color or sense of touch. Oxygen and fuel hoses shall not be interchangeable. Hoses having more than one gas passage shall not be used.
- d. When oxygen and fuel gas hoses are taped together, not more than four (4) of each 12 inches (10.2 cm) of each 30.5 cm shall be taped.
- e. Hose shall be inspected before use. Hose subjected to flashback or showing evidence of severe wear or damage shall be tested to twice the normal working pressure but not less than 200 p.s.i. (1378.96 kPa) before reuse. Defective hose shall not be used.

- f. Hose coupling shall not unlock or disconnect without rotary motion.
- g. Hose connections shall be clamped or securely fastened to withstand twice the normal working pressure but not less than 300 p.s.i. (2068.44 kPa) without leaking.
- h. Gas hose storage boxes shall be ventilated.
- i. Torch tip openings shall only be cleaned with devices designed for that purpose.
- j. Torches shall be inspected before each use for leaking shut-off valves, hose couplings and tip connections. Torches with such defects shall not be used.
- k. Personnel in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be instructed and judged competent by their employers for this important work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be readily available.

7. FIRE WATCH REQUIREMENTS

- a. Fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:
- b. Appreciable combustible material, in building construction or contents, closer than 35 feet (10.7 m) to the point of operation.
- c. Appreciable combustibles are more than 35 feet (10.7 m) away but are easily ignited by sparks.
- d. Wall or floor openings within a 35-foot (10.7 m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.
- e. Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.
- f. Fire watchers shall have fire extinguishing equipment readily available and be trained in its use. They shall be familiar with facilities for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.
- g. Fire Watches shall be trained at the worksite by the Site Supervisor. Training is to be documented and employees training files updated to reflect the training.
- h. Training shall be done when employees are initially hired and annually thereafter.

1. Refer to *Appendix I* of this section for specific policies and procedures regarding Fire Watch assignment and responsibilities.

8. WORKING IN CONFINED SPACES

- a. When hot work, welding, cutting or brazing must be performed in a confined space, only personnel who have successfully completed the company's safety training program and certification for confined space entry shall perform such work; and then only with prior authorization from the Site Supervisor utilizing written permit procedures as specified in the company's Confined Space Entry written safety program.
- b. For purposes of this section, a confined space shall mean a relatively small or restricted space (with comparatively examples cited by OSHA being a tank, boiler, pressure vessel, or small compartment of a ship).
- c. Ventilation is a prerequisite to work in confined spaces.
- d. When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.
- e. Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose they shall be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.
- f. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.
- g. In order to eliminate the possibility of gas escaping through leaks of improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight.
- h. Where practicable the torch and hose shall also be removed from the confined space.
- i. After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.

9. HEALTH PRECAUTIONS & VENTILATION

- a. The following requirements have been established on the basis of the following three factors in arc and gas welding which govern the amount of contamination to which welders may be exposed:

- ¾ Dimensions of space in which welding is to be done (with special regard to height of ceiling).
 - ¾ Number of welders.
 - ¾ Possible evolution of hazardous fumes, gases, or dust according to the metals involved.
- b. When welding must be performed in a space entirely screened on all sides, the screens shall be so arranged that no serious restriction of ventilation exists. It is desirable to have the screens so mounted that they are about 2 feet (0.61 m) above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby workers from the glare of welding.
 - c. Local exhaust or general ventilating systems shall be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum concentration allowed by OSHA.
 - d. A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. The suppliers of welding materials shall determine the hazard, if any, associated with the use of their materials in welding, cutting, etc.
- ¾ All filler metals and fusible granular materials shall carry the following notice, as a minimum, on tags, boxes, or other containers:

CAUTION

Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society.

- ¾ Brazing (welding) filler metals containing cadmium in significant amounts shall carry the following notice on tags, boxes, or other containers:

WARNING CONTAINS CADMIUM

POISONOUS FUMES MAY BE FORMED ON HEATING

Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators. See ANSI Z49.1-1967. If chest pain, cough, or fever develops after use, call physician immediately.

- ³/₄ Brazing and gas welding fluxes containing fluorine compounds shall have a cautionary wording to indicate that they contain fluorine compounds. One such cautionary wording recommended by the American Welding Society for brazing and gas welding fluxes reads as follows:

CAUTION CONTAINS FLUORIDES

This flux when heated gives off fumes that may irritate eyes, nose and throat.

- 1. Avoid fumes - use only in well-ventilated spaces.**
- 2. Avoid contact of flux with eyes or skin.**
- 3. Do not take internally.**

a. Ventilation for general welding and cutting

- ³/₄ Special safety procedures shall be taken when welding, cutting or hot work are performed involving fluorine compounds, zinc, lead, beryllium, cadmium, mercury, cleaning compounds, stainless steel, or other exotic metals or paints that release toxic fumes during hot work.
- ³/₄ When other metals are welded or cut through hot work, mechanical ventilation shall be provided:
- In a space of less than 10,000 cubic feet (284 m³) per welder.
 - In a room having a ceiling height of less than 16 feet (5 m).
 - In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.
- ³/₄ Minimum rate. Such ventilation shall be at the minimum rate of 2,000 cubic feet (57 m³) per minute per welder, except where appropriate local exhaust hoods and booths, or airline respirators approved by the U.S. Bureau of Mines for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations, except for hot work involving fluorine compounds, zinc, lead, beryllium, cadmium, mercury, cleaning compounds, stainless steel or other exotic metals or paints that release toxic fumes during hot work.

b. Mechanical local exhaust ventilation may be by means of either of the following:

- ³/₄ Freely movable hoods intended to be placed by the welder as near as practicable to the work being welded and provided with a rate of air-flow sufficient to maintain a velocity in the direction of the hood of 100 linear feet (30 m) per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3-inch (7.6 cm) wide flanged suction opening are shown in the following table:

Welding Zone	Minimum air flow (1) cubic feet / minutes	Duct diameter, inches (2)
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3 1/2
8 to 10 inches from arc or torch	425	4 1/2
10 to 12 inches from arc or torch	600	5 1/2
Footnote (1) When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.		
Footnote (2) Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.		

c. A fixed enclosure with a top and not less than two sides which surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet (30 m) per minute.

d. Ventilation in confined spaces.

Air replacement. All welding and cutting operations carried on in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All air replacing that withdrawn shall be clean and respirable.

e. Airline respirators. In circumstances for which it is impossible to provide such ventilation, airline respirators or hose masks approved for this purpose by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR part 84 must be used.

f. In areas immediately hazardous to life, a full-facepiece, pressure-demand, self-contained breathing apparatus or a combination full-facepiece, pressure-demand supplied-air respirator with an auxiliary, self-contained air supply approved by NIOSH under 42 CFR part 84 must be used.

g. Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or self-contained breathing equipment approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, a worker shall be stationed on the outside of such confined spaces to insure the safety of those working within.

h. Oxygen shall NEVER be used for ventilation.

10. FIRST AID

- a. First aid equipment shall be available at all times in areas where hot work, welding, cutting or brazing are being performed.
- b. All injuries shall be reported as soon as possible for medical attention.
- c. First aid shall be rendered until medical attention can be provided.

Fire Watch & Fire Protection Training

Applicable OSHA Standards: 29 CFR 1910 Subpart L, 1926 Subpart F

1. PURPOSE & SCOPE

- a. To establish methods and guidelines for the training of personnel in fire watch and fire protection.
- b. This policy applies to all employees and subcontractors working within NextSun Energy Electric Associates, LLC controlled job sites.

2. INTRODUCTION

The Company is responsible for the development and maintenance of an effective fire protection and prevention program at each job site throughout all phases of the construction, repair, alteration, or any demolition work. This training policy/module is intended for personnel working as Fire Watch during burning or welding performed during these activities.

3. REQUIREMENTS

- a. Fire Watches shall be trained at the worksite by the Site Supervisor. Training is to be documented and employees training files updated to reflect the training.
- b. Training shall be done when employees are initially hired and annually thereafter.

4. TRAINING PROGRAM CONTENT

- a. Cause and Prevention:
 - $\frac{3}{4}$ Fires do not just happen. They are caused by carelessness in operating equipment, handling hazardous materials and personal habits, such as smoking. Even though these actions are not usually deliberate, this still does not lessen the results.
 - $\frac{3}{4}$ Only individual employees can protect themselves against these hazards by learning carefully how to prevent fires.
- b. The three main components of fire prevention are:
 - $\frac{3}{4}$ Be alert for trouble before a fire starts.

- ¾ Eliminate all unsafe habits, which lead to fires.
- ¾ Conduct a fire prevention investigation of your work area prior to work start to remove any potential fire hazards.

c. General Fire Prevention Rules:

- ¾ Employees shall become familiar with the four classes of fire, their burning characteristics and the proper extinguishing agent for each:
 - **Class A** fires involve normal combustibles such as wood or paper. Water is a proper extinguisher.
 - **Class B** fires involves oils and flammable liquids. CO2 and dry chemicals are the correct extinguishers.
 - **Class C** fires involve electrical equipment. CO2 and dry chemicals are the correct extinguishers. Never use water on fires involving energized electrical equipment to avoid electrical shock and spreading of fire.
 - **Class D** fires involve combustible metals and require special approved extinguishing agents.
- ¾ Employees must never tamper with or move fire fighting equipment except for actual use.
- ¾ Report any equipment defects to your supervisor.
- ¾ Employees must know the location and proper operation of all protective fire equipment in the vicinity of their work areas.
- ¾ Material and supplies must be stored carefully to prevent falling, spilling, etc.
- ¾ All chemicals and solvents must be kept in properly labeled and approved containers.
- ¾ Used rags must be kept in metal or metal lined containers having metal covers.
- ¾ Never use flammable liquids for cleaning purposes.
- ¾ Before using solvents, discuss needed precautions with your supervisor and other parties involved.
- ¾ To extinguish a clothing fire on yourself or another person, **DROP** to the ground **AND ROLL** to cause a smothering effect or use a fire blanket or other means if available.
- ¾ Know primary and secondary exit routes from your area. When an alarm sounds,

evacuate immediately. Know site specific codes for emergency pages.

5. **FIRE EXTINGUISHER AND OTHER GENERAL INFORMATION**

NOTE: DO NOT ATTEMPT TO FIGHT A FIRE IF:

- You do not know what is burning;
- The fire is spreading rapidly out of control;
- You don't have adequate equipment;
- You might inhale toxic smoke.
- Only trained and qualified personnel are permitted to fight fires. Your training covers only small smolders and fires that are easily put out with a fire extinguisher.

6. Employees whose work assignment may require them to use a fire extinguisher shall be trained in such use prior to the job assignment. Training information and instructions on how to use a fire extinguisher safely are explained in Item 7 below.
7. All fire extinguishers shall be placed in conspicuous locations near the work area. Know where the nearest fire extinguisher is located, the type of fire it should be used on and how to operate it.
8. A fire extinguisher must be within 20-30 feet of flame or ignition type operations in progress.
9. All fires, whether they are ignitions or smolders, must be reported to the Site Supervisor, so that an investigation can be initiated to determine cause.
10. Any fire extinguisher that has been used shall be returned to the Site Supervisor for replacement.
11. Supervisors shall make sure that all employees under their supervision understand the proper use of a fire extinguisher.
12. Keep work areas clean and orderly, free of trash and scrap materials as this could prevent small fires from becoming major disasters.
13. Keep all passageways, work areas and aisles clean to facilitate evacuation should a fire start.

14. Equipment must never be refueled while running or when hot.
15. If the piece to be welded or cut cannot be moved to an area free of fire hazards, that hazards shall be removed from the hot work area prior to commencing work. All combustible materials under or near welding or burning operations must be moved to a safe distance away or covered with fire retardant material.
16. Guarding shall be used if the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed. Guarding shall effectively confine the heat, sparks, and slag, and to protect the immovable fire hazards.
17. Smoking is not allowed on the project except in areas designated as smoking areas. Discard butts in approved containers, not on the floor or in trash cans.
18. All fires start because of a combination of ignition source, heat, fuel, and oxygen.
19. The number one cause of workplace fires is electrical equipment. These include:
 - $\frac{3}{4}$ Damaged electrical cords
 - $\frac{3}{4}$ Loose electrical connections
 - $\frac{3}{4}$ Overloaded circuits
 - $\frac{3}{4}$ Defective power tools
 - $\frac{3}{4}$ Welding and cutting operation
 - $\frac{3}{4}$ Chemical reactions
 - $\frac{3}{4}$ Heaters

6. **FIRE WATCH FOR WELDING AND CUTTING OPERATIONS**

Fire Watch personnel shall be aware that that welding sparks can travel as far as 35 feet. Safe procedures prior to and during welding operations are:

- a. Ensure that the area has been checked by an authorized person with a meter for flammable gases and vapors
- b. Remove any combustibles such as paper, rags, etc
- c. Have a fire extinguisher and misting hose (if required) on hand
- d. Assure that proper PPE is on hand and being used; and
- e. Remain 30 minutes after spark producing and welding operations are over to assure that no smoldering or fires break out

7. **HOW TO USE A FIRE EXTINGUISHER (Instruction for employees)**

- a. First rule of thumb is “DON’T PANIC.” Keep your calm and wits about you, do not let an adrenaline rush cause you to lose control. Just remember the word PASS, which stands for Pull the pin, Aim, Squeeze, and Sweep:
 - $\frac{3}{4}$ **PULL THE PIN** - This will allow you to use the extinguisher.
 - $\frac{3}{4}$ **AIM AT THE BASE OF THE FIRE** - In order to extinguish a fire you must put out the ignition source at the base of the fire. Stand eight to ten feet from the blaze (if you believe this is a safe-enough distance so that sparks, embers and burning residue will not blow back at you due to the pressure of the extinguisher chemical stream).
 - $\frac{3}{4}$ **SQUEEZE THE TOP HANDLE OR LEVER** - This releases the pressurized extinguishing agent in the extinguisher.
 - $\frac{3}{4}$ **SWEEP FROM SIDE TO SIDE** - Until the fire is completely out. Do not sweep up and down.
- b. Then move a safe distance away until you are sure the fire is out.
- c. Hands-on instruction will be used for demonstration.