



PaloVerde™
GENERATING STATION



SAFETY MANUAL

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**SUCCEED
TOGETHER**



**STAR WORKSITE
Voluntary
Protection
Program**

Palo Verde Generating Station
Event-Free, Injury-Free

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SAFETY MANUAL

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PALO VERDE GENERATING STATION

INDUSTRIAL HEALTH AND SAFETY

Safety as a Value

The safety of all Palo Verde Generating Station (PVGS or Palo Verde) workers (employees and non-utility workers) needs to be ingrained as a value, something never to be compromised. This approach to safety needs to start at the highest level of site leadership, and then continue to be reinforced throughout each and every front-line employee. Everyone has an important role in working safely.

Senior Management must exert sustained leadership in establishing safety goals and demanding accountability for safety and health performance for a safety and health program to be effective. The role of management then becomes one of goal setters, enablers, problem solvers, and accountability reviewers. Proper safety and health management necessitates continuous involvement by direct supervision and management.

Everyone's Responsibilities

People are the most critical element of our safety and health program. People provide the solutions to our safety problems. Involvement is a dynamic learning and teaching process, which serves as a stimulus for employee cooperation and participation. Providing opportunities for individual participation enhances both the program's effectiveness and safety attitude of the employee.

Every employee is involved in activities and decisions that impact their safety and the safety of others. Palo Verde is committed to sustaining OSHA Voluntary Protection Program (VPP) STAR worksite status.

- Take responsibility for your own safety and the safety of your co-workers.
- Recognize, report, and correct unsafe conditions.
- Identify existing and potential hazards and take steps to correct or address before starting a task.
- Use appropriate personal protective equipment (PPE).
- Ensure that pre-job briefs are conducted and two-minute drills are conducted at the worksite.
- Recognize and reinforce co-workers for safe behaviors.
- Injuries, no matter how minor, shall be reported to the leader in charge immediately.
- Design safety into each task.
- Take action for immediate safety concerns.
 - Mitigate or eliminate the hazard
 - Stop work and place equipment in a safe condition
 - Barricade the area to ensure personnel will not be injured
 - Notify your immediate leader
- **Call 82-4444 (623-393-4444) for all emergencies.**
- Contact Industrial Health and Safety Department at UB-SAFE or 82-SAFE (623-393-7233).

SECTION I GENERAL REQUIREMENTS

ARTICLE 1

OVERVIEW

A. Emergency Contingencies

1. In the event of extreme circumstances, to maintain or restore core cooling, to mitigate an off-site release in progress, or if fuel damage is imminent without immediate action AND an Emergency Plan Classification of ALERT or above has been declared, the Emergency Coordinator or the Emergency Operations Director may authorize a deviation from the Safety Manual and related safety procedures. Utilizing the provisions of this emergency contingency shall not be invoked for operational or maintenance convenience. (INPO IER L1 13-10, Nuclear Accident at the Fukushima Daiichi Nuclear Power Station)

ARTICLE 2

STOP WORK AUTHORIZATION (SWA) POLICY

At Palo Verde all employees, contract workers and station visitors have the right, authority, and obligation to temporarily stop any job, activity, or task they believe is unsafe, could cause injury to themselves or others, damage plant equipment, initiate an undesirable event, or could violate safety procedures.

The purpose of the SWA is to empower workers with the ability to immediately prevent an injury, accident, or negative incident before it occurs without fear of retaliation, discrimination, negative consequences, or ridicule from managers, supervisors, or co-workers. SWA is a safety partnership between workers, regardless of job title, position, or company affiliation, that encourages collaboration through the idea of “We” rather than “Me” or “Them,” which sustains a healthy and strong safety culture. SWA is an important link between psychological safety and physical safety, that openly allows individuals to share their perspective in a respectful and professional manner for a common goal.

SWA is warranted whenever they see, witness or suspect any of the following examples, however this list is not inclusive of every possible situation where SWA should be used. SWA is warranted whenever:

- Unsafe or hazardous conditions or actions are suspected.
- Unsafe behaviors or actions are observed.
- Individuals who are not wearing or improperly wearing PPE.
- Faced with uncertainty, lack of information or confusing instruction.
- Unexpected conditions are encountered.
- Unexpected changes in work scope or work plans.
- Emergency situations or unexpected alarms.
- Tools or equipment are improperly used.
- The right tools or equipment are unavailable for the job.
- After an injury (regardless of how minor), close call or near miss event.

Once SWA has been initiated the following actions shall be followed:

- All affected workers involved with the particular job shall temporarily stop all work activities.
- The unsafe condition, hazard, or behavior identified with all affected workers.

- If the SWA is due to an injury, then emergency services shall be immediately notified as needed in conjunction with additional actions according to Section I, Article 2 “Industrial Injury Reporting.”
- If the SWA is due to a Close Call or Near Miss, complete additional actions according to Section I, Article 3 “Close Call/Good Catch.”
- If possible, correct or mitigate the unsafe condition, hazard, or behavior with the workplace placed in a safe condition.
- Notify the supervisor or leader of the responsible work group(s) and Industrial Safety of the SWA.
- All affected workers, including leadership and Industrial Safety, are required to discuss the issue or concern and collaborate to determine an adequate solution to address or abate the safety concern(s).
 - If the concern is related to plant operations and/or plant equipment the respective Shift Manager shall also be contacted for assistance.
- The work, job, or task shall not be restarted until all affected parties have agreed to the resolution.
- The details of the SWA shall be documented by a CR or CAR (for WRF) for trending and other additional corrective actions.

ARTICLE 3

INDUSTRIAL INJURY REPORTING & FOLLOW-UP

A. Injury Reporting

1. Injuries, no matter how minor, shall be reported to the leader in charge.
 - (a) Ensure to preserve the event scene from being disturbed or cleaned until the Industrial Health and Safety group has been contacted and has the opportunity to perform an investigation.
 - (b) The leader will escort the employee to the medical facility (on-site medical, fire protection nights & weekends, or off-site medical facility).

NOTE: If an injured employee’s leader is unable to escort an individual, then the leader may delegate the authority to another leader.

- (c) If duty restrictions are being considered by the medical professional, the leader shall get involved with the determination of restrictions to ensure:
 - Employee’s physical job duties, during the time frame for potential restrictions, are clearly explained and understood.
 - The restrictions assigned shall not aggravate the employee’s injury further.
- (d) Leaders shall report the event/injury up their chain of command to the Senior Management level as soon as possible and notify the respective Unit Control Room or Water Resources Control Room, no later than the end of shift.
- (e) Verbal notification to the on-call Industrial Health and Safety Consultant shall be made as soon as possible, but no later than the end of shift.
- (f) Once an injury has been reported and appropriate treatment provided, leaders shall document the injury in the EventWay System by accessing the PV Safety website via PV Online as soon as possible and no later than the end of shift.

- (g) Leaders shall generate a Condition Report (CR) in accordance with procedure 01DP-0AP12, *Condition Reporting Process*, and investigate the injury per guidance of 01DP-0AP59-06, *Palo Verde Human Performance Event Evaluation Administrative Guideline*. (CRAI 4264798)

NOTE: Water Resources (WR) addresses injuries and close calls with Corrective Action Requests (CAR) in the APS Corrective Action Program rather than with CRs. Any reference to CRs will be understood to mean a CAR for WR industrial safety related issues.

- (h) Our goal is to identify and address organizational weaknesses/gaps when events occur. A Prompt Human Performance Review Board, a Learning Team, or an Operationally Curious Conversation will be conducted after an event, relying on the expertise of our employees to identify where these gaps exist and how to improve.
 - People Problems/malicious actions will be handled outside of the learning process through partnership with HR.

B. OSHA Log and Summary of Occupational Injuries/Illnesses

1. The Industrial Health and Safety Department shall maintain a log and summary of all recordable occupational injuries and illnesses of PVGS employees. The OSHA Form 300-A shall be used as the official log.
2. The APS EventWay System shall be used to maintain a log and summary of all occupational injuries and illnesses.
3. The annual summary of OSHA recordable cases, OSHA 300-A Form, shall be posted from February 1 through April 1 of the year after the reporting period.

ARTICLE 4

CLOSE CALL/GOOD CATCH

A. Close Call Determination

1. Definition: Any event that has taken place which has the potential for personal injury or equipment (property) damage, but resulted in no injury which presented a learning experience to support our zero accident culture.
2. The intent of reporting close calls is to find the causes of problems and solve them. Another important factor is learning from these events and hopefully preventing someone else from making a similar mistake.
3. The following guidelines shall be taken into consideration when determining if a close call occurred:
 - (a) Did the incident have the potential to have caused injury to employees or substantial property damage?
 - (b) Upon notification of the incident, does it appear that we can gain experience or insight as a result of an investigation?
 - (c) Are procedures/policies/guidelines, which are in effect relative to the incident, unclear?
 - (d) Could there be a lack of training for employees involved?

- (e) Are there any circumstances involving the incident that are unclear and may have contributed to the close call?
- (f) Are guidelines needed for the task and not available?

If the answer to any of these questions is yes, a close call report is warranted.

B. Reporting a Close Call

1. Leaders shall document the event on a CR and in the APS EventWay System as soon as possible and no later than the end of the shift during which the event occurred.
2. Ensure that the CR and Event Alert (EventWay) are identified as documenting a close call.

C. Good Catch Determination

1. Definition: A behavior or condition that is corrected which mitigates the risk of a close call or injury from occurring.
2. The intent of reporting Good Catches is to develop Operating Experience (OE) for trending of low level safety issues before they become an injury.

D. Reporting a Good Catch

1. Personnel shall document the item in the APS EventWay system.

ARTICLE 5 BARRICADE TAPE PRACTICES

A. General Barricade Tape Practices

1. It is the responsibility of the worker who erects barricade tape and boundary hazard tags to ensure they are maintained the entire time work is in progress or the condition exists. The worker must make sure they are removed immediately upon completion of the work or elimination of the hazard. If barricade tape is staged in an area for repeated use it must be stored out of the walkway in an appropriate container or bag.
2. It is the responsibility of every person entering any barricade taped area to first determine the potential hazard(s) and then take appropriate protective action.
3. Barricade tape shall be placed to provide a safe clearance zone around the hazard to prevent contact with the hazard.
 - (a) A minimum safe clearance zone of 6 feet is preferred.
 - (b) When feasible, hang the tape approximately 3 feet off the ground to aid in the visibility of the barrier.
4. Boundary hazard tags are required on all accessible sides of the barricade taped area. Large barricade taped areas shall have boundary hazard tags placed at intervals of approximately 40 feet. Each tag shall bear the name of the employee in charge, contact phone or pager number, and a brief description of hazard.

5. If planning an activity using barricade tape, then a Job Hazard Analysis (JHA) can be used to document and implement the plan. The use of drawings and/or pictures is preferred and can be used with the JHA.
6. Barricade tape and boundary hazard tags are available in both the tool room and the warehouse.
7. To increase visibility appropriate signs can be used in addition to tags stating what activity is in progress such as a Danger sign with "Heavy Lift in Progress."

NOTE: During Outages, it is preferred to place a dayshift and nightshift contact number on each tag of the barricade tape. Mobile phone numbers are preferred on barricade tape during Outages.

B. Red (DANGER) Barricade Tape Practices - *One of Six Rules to Live By - PVGS Std. & Exp.*

1. Red barricade tape includes a signal word printed on the tape to designate "DANGER" and is a temporary method used to define a boundary around a recognized hazard. If not avoided, the hazard will likely cause death or serious physical harm.

Examples of recognized hazards, e.g., steam leaks, hazardous chemical spills or leaks, Electrical hazards, and Rigging evolutions.

NOTE: If commercially available Red Arc Flash Boundary barricade tape is used, it should be used in accordance with PVGS barricade tape practices.

2. To establish a RED (DANGER) barricade tape boundary around a recognized hazard proceed as follows:
 - (a) Determine area needed for recognized hazard exclusion zone.
 - (b) Communicate with all affected personnel working in the area.
 - (c) Stage barricade tape with tags around the boundary of hazard exclusion zone.
 - (d) Clear affected personnel from inside the boundary of the hazard exclusion zone.
 - (e) Confirm hazard exclusion zone is clear of personnel.
 - (f) Establish RED (DANGER) barricade tape boundary complete with tags around hazard exclusion zone.
3. It is the responsibility of every employee entering any RED (Danger) barricade taped area to: have a work related need, obtain authorization of the employee in charge of the work area, determine the potential hazard(s) and then implement appropriate protective measures. All other personnel are restricted from the area.
 - (a) Entry authorization may be granted by a leader from the department responsible for the red danger barricade if the employee in charge is not available. The responsible work group leader shall determine what hazards exist in the area.
 - (b) An attempt must be made to find the employee in charge if red barricade tape is encountered with no boundary hazard tags or in a degraded condition. A responsible work group leader shall determine what hazards exist in the area if the employee in charge is not available. They shall also attach boundary hazard tags bearing his/her name on the barricade tape or have the tape removed if it is determined the hazard is no longer present.

4. Prior to the establishment of a Red Danger Barricade notification shall be made to the respective Unit Control Room or WR Control Room as appropriate or their designee during outages.
5. If erecting barricade tape in containment, then perform the following:
 - (a) Contact the containment coordinator prior to the installation of any red barricade tape in containment.
 - (b) An evaluation must be performed to determine the impact of the barricade on safely evacuating people from the building in the case of an emergency.
 - (1) If the area to be barricaded impacts one of the evacuation travel paths, then notification shall be made to all workers in the area, to include Operations and the Fire Department.
 - (2) A specific plan must be in place to minimize the time the evacuation travel path is blocked or deferring the work to a time when the least amount of personnel are impacted.
6. Red barricade tape shall be removed immediately after the work is complete or hazards are eliminated.
 - (a) Removal of the barricade tape must be at the direction of the employee in charge or the responsible work group leader.

C. Yellow (CAUTION) Barricade Tape

1. Yellow barricade tape includes a signal word printed on the tape to designate "CAUTION". Yellow (CAUTION) barricade tape shall be used to define hazards which may cause minor or moderate injury to personnel, e.g., personnel working in the overhead, trenches/excavation, designated work/laydown areas, trip hazards or exposed hot surfaces.
2. Yellow barricade tape shall have boundary hazard tags attached to each accessible boundary. Each tag shall bear the name of the employee in charge of the project, contact phone number, along with a brief description of the hazard.
3. Prior to entry, personnel shall review the boundary hazard tag information, assess the work area hazards, and take appropriate action.
4. Yellow barricade tape shall be removed immediately after the work is complete or the hazard is eliminated.
5. Yellow barricade tape, regardless of the language printed on it, is allowed to be used at Palo Verde. Only use yellow (Caution) barricade tape with "Do Not Enter" printed on it, in areas where the general public wouldn't normally need to access, i.e., around specialty equipment laydown areas, away from a general walkway when possible, around sensitive equipment, etc. The tags SHALL have clear contact information in case access is needed and the owner SHALL make themselves available at all times. Access can be given from anyone within the work group that erected the barricade tape in person or by telecom.

NOTE: Operations, Fire and Security personnel will have unrestricted safe access into any area within the boundary (yellow or red) to protect nuclear safety and security. Routine work that is not required for nuclear safety/security will be restricted to the limitations afforded by the tag and work group.

NOTE: Yellow barricade tape with a hazard boundary tag and a biohazard sign may be used to designate a biological hazard. A biological hazard is defined as those infectious agents presenting a risk of death, or injury or illness to employees. Biohazard signs are available in the tool room.

D. Red Pennant Flagging/Red & White Barricade Tape

1. Red Pennant Flagging or Red and White barricade tape is used exclusively to identify the boundary of a crane counterweight swing radius.
2. Personnel shall not cross this boundary without permission of the crane operator or delegated authority.

ARTICLE 6

VARIANCES

A. General

1. New requests for variances shall be of a work related business need. Variances will not be granted for reasons of personal convenience. (CRDR 3548233)
2. A variance is NOT an exemption from a safety standard. The variance owner shall be able to show that the safety of workers is maintained or improved while the safety standard has an approved variance in effect. A variance shall not exceed more than one calendar year and has to be resubmitted for a reevaluation by the Industrial Health and Safety Director (or designee) by January 1st for consideration each additional year. The special variance form can be found on the Palo Verde Forms web page in the Safety category. (ACT 4304453)
3. The request for a site safety standard variance shall contain:
 - (a) The safety standard for which the variance applies
 - (b) The job for which the variance is requested
 - (c) The duration of the variance
 - (d) A detailed explanation of why a variance is requested
 - (e) A detailed description of the controls or methods that will be used to provide workers with the same or better level of safety afforded to them by compliance with the standard(s) from which they are seeking a variance. (ACT 4304453)
4. During pre-job briefs the work group, crew or persons affected by the variance shall be fully briefed on the conditions of the variance. This shall include the boundaries, limitations, duration and any alternative safety practices employed as a result of the variance. (ACT 4304453)
5. Variances shall be posted in the area in which the work is being performed and removed at the completion of the task. (ACT 3005208)
6. A verbal variance may be approved in emergency cases where written approval would not be timely and a delay could cause harm to employees, non-utility workers, vendors or the public. However, the requirements of Section 3 and 4 shall be adhered to. The verbal approval by the Industrial Health and Safety Director (or designee) is mandatory and the use of an SME should be obtained, time permitting. All verbal variances shall be followed up with a written variance. (ACT 4304453)

ARTICLE 7

CONTRACTOR SAFETY (NON-SECONDED EMPLOYEES)

A. General

1. At a minimum, Contractors, Service Providers, and Suppliers performing work at Palo Verde Generating Station must comply with the requirements contained within the Palo Verde Safety Manual and referenced procedures.

B. Pre-Job Briefs

1. Contractor leaders shall ensure that the employee in charge conducts a pre-job brief with the employees involved before they start each job and have a general understanding of the PVGS Standards and Expectations Book.
2. If the work or operations to be performed during the workday or shift are repetitive and similar, at least one pre-job brief shall be conducted before the start of each day or shift. Additional briefings shall be held if significant changes, which might affect the safety of the employees, occur during the course of the work.
3. When a job includes any task which could place personnel in proximity to hazards capable of serious injury, appropriate measures shall be established to eliminate or effectively control exposure to the hazard. Procedure 01DP-0IS14, Palo Verde Generating Station Job Hazard Analysis provides a systematic approach to identifying, evaluating and taking appropriate measures relative to hazard exposure.

C. Safety Program

1. The contractor shall prepare a comprehensive written site specific safety program covering all aspects of onsite construction operations and including a detailed hazard analysis for each activity associated with its subcontract. In no case will onsite work commence until the program and/or appropriate supplementary submittals have been presented to Palo Verde's authorized representative. Acceptance of contractor initial and supplementary programs only signifies the submittals generally conform to the requirement contained and referenced herein. It does not relieve the contractor of the responsibility of providing employees with a safe and healthful work environment, or complying fully with all applicable statutory, regulatory, contractual or other requirements.

NOTE: Contractors may use their own safety manual, safety programs, or safety procedures at PVGS if they are approved for use on-site by the Industrial Health & Safety Director (or designee). These documents shall be submitted to the PV Industrial Health & Safety Department for review, and approved prior to starting work at PVGS.

D. Contractor Requirements

1. All contractors follow the same safety requirements as the Palo Verde workforce. Exceptions shall be approved by the Industrial Health and Safety Department on a case-by-case basis. The individual Palo Verde Project Managers will direct each contractor workforce on which programs are mandatory for them to be involved in, while working onsite. When a contractor does not have electronic authorization and/or access to these programs, it is up to the Palo Verde Project Managers to provide them with hard copies to comply with the Palo Verde Safety program(s).

SECTION II WORK PRACTICE AND FACILITY SAFETY

ARTICLE 1 OFFICE SAFETY PRACTICES

A. Floors

1. During inclement weather, look for wet floors.
2. Promptly clean up all water spilled.

B. Stairways

1. Use the handrails provided when ascending or descending stairways.
2. Do not carry items in both hands that would prevent the use of handrails.

C. Drawers and File Cabinets

1. Close all desk or file drawers when not in use.

D. Sharp Objects

1. The blades of paper cutters shall be left in the down position when not in use.

ARTICLE 2 HOUSEKEEPING PRACTICE

A. General

In addition to requirements outlined in 30DP-0WM12, Housekeeping, standard housekeeping practices that shall be required of all personnel are as follows:

1. General housekeeping for non-warehouse areas concerning cabinets and shelving:
 - (a) Cabinets and shelves shall not be overloaded or have improperly stacked items, to avoid falling object hazards. Owners of shop storage area shall follow the manufacturer's load rating recommendations and prominently display the weight rating for each shelf or display total weight rating of the unit.
 - (b) The top of most cabinets are not designed for heavy loads or storage and must be kept free from accumulation of materials that constitute hazards from tipping, fire, or pest harborage.
2. Maintaining a 3 foot exclusion zone in front of certain equipment is required to facilitate the timely operation of components during an emergency. Examples of items needing this 3 foot exclusion zone are Fire Protection equipment (commonly identified by a painted red barrier), bullet resistant enclosures (BRE) which are not identified due to security concerns, and electrical equipment (such as breaker panels, switch boards, fuse boxes, safety disconnect switches, transfer switches, motor control centers, load centers, control switches).

3. At Palo Verde, the Facilities Department is responsible for determining where approved Smoking Areas are located. Smoking is permitted in designated “Smoking Areas” only. The Palo Verde management expectation is that by smoking ONLY in allowed areas, housekeeping will be improved by eliminating cigarette debris from around the station. Questions or concerns should be discussed with your leader.

B. Cable Ties

1. Cable ties (tie-wraps) present a safety hazard when cut off and sharp edges are left. At the same time, the portion of the cable tie removed can become a housekeeping issue and in some instances even present an FME concern. If a cable tie is cut, ensure the ends do not present a hazard to others. Tape the end or turn the cut portion away from travel paths. Pick up the cut off ends to help keep work areas clean and prevent an FME issue. (CRAI 3151417)

ARTICLE 3

WALKING/WORKING SURFACE PRACTICES

A. Sidewalks/Crosswalks

1. The clear and safe access to and from work locations within the facility and the protection of personnel from falls while working on elevated platforms is key to the facility safety program.
2. Where provided, sidewalks and crosswalks shall be used for access from one place to another.

B. Aisles/Walkways

1. All designated walkways in general areas and work areas shall be kept clear and in good repair, with no obstruction across or in the pathway which creates a personal hazard. Obstructions in the work area that create a personal hazard should be eliminated if possible or properly identified using the appropriate barricade tape/tag. (CRDR 3632814)
2. Power cords and hoses can present a serious tripping hazard to personnel when allowed to lie across a walkway. Eliminate or mitigate trip hazards by using the following simple techniques:
 - (a) Run and secure power cords and hoses in the overhead, beside, or under the walkway. When these are run in the walkway, use cable/hose protectors to mitigate the trip hazard and avoid damaging the hose or cord.

C. Floor Loading

1. Floors and roof load limitations shall be determined. Mezzanine load limits shall be determined and posted in conspicuous locations for each area throughout the facility. (OSHA 1910.22(d)(1))
2. The posted load ratings shall not be exceeded under any circumstances.
3. Load limit information can be obtained from the Specific Building Criteria Manual. Questions should be directed to Civil Engineering. (CRAI 3869656)

D. Protection of Floor Openings

1. Stairway floor openings or ladderway floor openings where there is a fall potential greater than four (4) feet shall be guarded with standard railings and toe boards except for the entrance.

2. Ladderway floor openings or platform entrances shall be protected by a swing gate.
3. Hatchway, manhole or pit openings shall be covered at all times when not in use. When hatch covers are removed, removable railings with toe boards shall be installed.
4. Any temporary floor opening/hole shall be protected by either removable railings with toe boards, a floor hole cover of standard strength and construction that is secured against accidental displacement, or constantly be attended by someone.
5. Temporary floor opening cover shall be marked with a Danger sign and the word “hole” or “cover” to provide warning of the hazard.
6. Floor holes created for machinery, pipes, or other plant equipment in which personnel cannot accidentally walk into, but leave an opening greater than 1 inch in its least dimension shall be protected with a cover or toe board to prevent tools or material from falling through.

E. Protection of Wall/Window Openings

1. Wall openings where there is a fall potential greater than four (4) feet shall be guarded with standard railings and toe boards, except for window openings where the bottom of the opening is three (3) feet or more above the floor.

F. Protection of Stairways

1. Stairways with 4 or more risers or a vertical rise of 30 inches (whichever is less) shall be equipped with stair-railings and hand rail(s) so there is no fall hazard on either side of the stairway.

G. Ships Stairs (Ships Ladders)

1. A ships stair has a pitch range of 50 to 75 degrees to the horizontal, equipped with treads and stair rails.
2. When using ships stairs always ascend and descend facing the stairs and never carry anything in your hands so both handrails can be utilized. Although commonly referred to as a ships ladder, gloves are not required when using ships stairs.
3. Portable stairs having the same pitch as a ships stair will be treated as a ships stair.

ARTICLE 4

PORTABLE AND FIXED LADDER PRACTICES

A. Design and Construct

1. Straight, step and extension ladders shall be used as a means to reach locations that require inspection or work activities of short duration.
2. Only ladders constructed of non-conductive materials may be used for work on or in proximity to energized electrical equipment, circuits, cables, etc.
3. Portable straight ladders and stepladders shall have non-skid bases or safety feet.

B. Inspections

1. Personnel using a portable ladder shall visually inspect the ladder for any defects before and after each use. The ladder inspection shall include verifying the required vendor labels are attached. The vendor labels are of three types: (1) safety instructions, (2) weight rating, and (3) manufacturer's name. If these three specific labels are not present or are not legible, the ladder shall be immediately removed from service until replacement labels are applied.
2. Ladders are deemed removed from service when a completed out of service tag has been applied and the item removed from a serviceable location and a CR generated. The CR shall include the ladder location and if known, the area number.
3. When a ladder falls or is severely struck, it shall be visually inspected for damage.

C. Precautions

1. Ladders shall not be used during a strong wind except in an emergency, and then only when they are securely tied.
2. Stepladder legs shall be fully spread with the spreading bars locked in place and shall not be used as a straight ladder.
3. The top three rungs of a straight ladder and the top two steps of a stepladder shall not be used for standing, climbing, or sitting.
4. Portable ladders should ideally be stored inside or in an area where direct sunlight will not damage the integrity of the ladder.

D. Placement

1. Ladders shall not be placed in front of doors opening toward the ladders unless the door is open, locked, or guarded.
2. Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.
3. Portable ladders shall be placed so that both side rails have secure footing.
4. Straight or extension ladders shall be positioned at approximately a 75-degree angle. Use the four-to-one ratio; that is, place the ladder so its feet are one foot away from what it leans against for every four feet in height to the point where the ladder rests.
5. Straight or extension ladders shall be positioned so the top extends at least 3 feet above the work location or a 3-foot high (minimum height) grab rail shall be provided to assist employees in mounting and dismounting the ladder.

E. Securing Ladders

1. When working from a portable straight/extension ladder, the ladder shall be securely placed, held, tied or otherwise made secure to prevent slipping or falling.
2. When not in use, ladders shall be secured in place.

F. Ascending or Descending Ladders

1. Always face the ladder when ascending or descending and maintain a 3-point contact. If material must be handled, raise or lower it with a rope and/or a tool bag.
2. Ensure that shoes are not greasy, muddy, or slippery before climbing.
3. Gloves shall be worn while climbing ladders.

G. Working from a Ladder

1. When working from a ladder, the employee shall face the ladder.
2. A hand-line (min. 1/8" diameter rope or cord) will be used to pass tools and equipment up or down.
3. Only one employee shall work from a ladder at one time unless it is specifically designed for use by more than one person.
4. When working from ladders, the worker shall ensure the center line of the upper chest remains within the side rails of the ladder.
5. Alternative methods, such as mobile scaffolding, present a safer method of performing complex jobs that would potentially place a worker on a ladder in the line of fire.

H. Rope Ladders and Rope Ladder Systems

1. Shall be used in accordance with the manufacturer's instructions, if provided and a JHA initiated according to 01DP-0IS14.
2. Shall be inspected prior to use for evidence of damaged components, tears, fraying, weathering, excessive wear, etc. If any discrepancies are noted, then the rope ladder/system shall be removed from service and disposed of.

ARTICLE 5

FIRE PREVENTION/PROTECTION

A. APS/Palo Verde Emergency Evacuation Plans

1. All personnel are expected to know and comply with the APS / Palo Verde Building Emergency Evacuation Plan. Palo Verde Building Emergency Evacuation Plans are located on the Palo Verde Safety website under Building Evacuation and on the Inside APS website under Emergency Action Plans. Employees should familiarize themselves with evacuation routes applicable to their work area (CRAI 4280713, CRAI 3773617, and CRAI 3379386).
2. Building Coordinators in the Palo Verde Emergency Evacuation Program shall perform their emergency evacuation drill on the same day and at the same time the Fire Protection Group sounds the alarm for their annual Fire Protection System test. This will ensure a drill is performed in all buildings on an annual basis. The Building Coordinators may choose to run additional evacuation drills throughout the year.

B. Temporary Unscheduled Loss of Power Building Evacuation Guidelines

1. In the event of a loss of power, the affected buildings are to be evacuated no later than the battery life of the emergency lighting/fire alarm systems.
2. Non-response personnel shall not enter a building that is experiencing temporary /unscheduled loss of power.

C. Cooking

1. Cooking or open flames require prior approval from the fire department.
2. Outdoor cooking fires shall be a minimum of 25 feet from any building or structure.
3. Outdoor cooking fires shall be constantly attended by a competent person until the fire is properly extinguished. A fire extinguisher shall be readily available for use.

D. Cubicle/Workstation

1. Personal (electrical) appliances for use in cubicles or workstations require approval from the Fire Marshall.

E. Portable Space Heaters

1. Prior to using any portable space heaters (electric, propane, liquid fuel, wood, etc.) at the station, written authorization shall be first obtained from the PVGS Fire Marshall.

ARTICLE 6 **“LINE OF FIRE” PREVENTION**

A. General

A simple definition of “line of fire” is being in harm’s way. Line of fire injuries occur when the path of a moving object intersects with an individual’s body.

Three major categories of line of fire incidents are: caught-in or between incidents, struck-by incidents, and released energy incidents. There are many specific examples of hazards for each of these categories. A few quick examples for each category are:

1. **Caught-In or Between:** Common pinch points, i.e., turning a valve hand wheel with minimal clearance; a worker is standing between MSSS hardened barrier door and door frame; placing hands or other body parts in equipment that is rotating or moving.
2. **Struck-By:** Moving a gas cylinder bottle by the cap which is not fastened securely; metal banding snapping back at an employee after being cut; a pedestrian struck by a moving vehicle, or an object falling from a higher level striking a worker below; using an open ended box wrench on a bolt and it slips off.
3. **Released Energy:** Steam or high pressure fluid escaping from a flanged pipe joint; attempting to clear a clogged pipe with energy or pressure stored behind the clog; removing a radiator cap on an overheated motor.

B. Eliminate/Mitigate Line of Fire Incidents

1. The best way to avoid Line of Fire incidents is to eliminate the hazards that cause these incidents whenever possible. By totally eliminating the hazards there is no chance that you or anyone else in the work area can be injured by that hazard, i.e. LOTO (Lock-Out/Tag-Out).
2. When elimination is not possible - mitigate. Engineering controls are the next best choice in protecting yourself from Line of Fire incidents. Some engineering controls that could protect you from Line of Fire incidents include physical barriers, guarding around moving parts, and toe boards on elevated work platforms to prevent objects from falling to the area below. There are many other possible engineering controls that could be used depending on the specific hazard.
3. Total elimination of hazards is not always possible and engineering controls may not be feasible or they can fail. It is important to decrease your chance of being a victim of Line of Fire injuries by not putting yourself in harm's way in the first place, hence adjust your body positioning. Remove your body from the direct Line of Fire scenario. Understand the work tasks that are going on around you and the associated hazards. Ask yourself what is the worst that can happen or what will happen if a certain safeguard fails. Recognize Line of Fire hazards and act accordingly.

ARTICLE 7

SEVERE WEATHER THUNDERSTORM GUIDANCE

A. Purpose

This plan has general guidance when working in extreme weather conditions outside at Palo Verde Generation Station (PVGS). This was developed to communicate the expectations during the event of high wind conditions and/or thunderstorms while performing work outdoor and during long periods of pedestrian transition, from one place to another at PVGS.

B. High Wind Speeds

1. **Crane activities** - wind speeds will be monitored using the Met Tower readings (obtained by contacting the Control Room), crane mounted anemometers, and hand-held anemometers. Collaboration between Leadership and Crane Operators will be responsible for retrieving the current wind conditions and determining actions to be taken, to include work stoppages and returning to planned work activities. The Control Room Supervisors will be notified when work is suspended and when suspended work commences.

All mobile crane operations will STOP when the sustained wind velocity exceeds 25 MPH or exceeds the crane manufacturer's recommendation (30DP-9MP11 4.8.1 and 30DP-9MP10, 4.3.2.C). Crane booms shall be anchored or lowered until wind conditions subside.

2. **JLG Boom Lift/Manlifts/Scissor Lift/Forklifts/Mobile Equipment** - will be suspended when the sustained wind velocity exceeds 25 MPH, at the discretion of Leadership, or by following the recommended guidance from the manufacturer when that guidance is less than 25 MPH. Leadership will determine when work continues after a stoppage. (30DP-9MP11 4.8.1 and 30DP-9MP10, 4.11.14)

C. Thunderstorms

1. **Protect Our People** - Upon the observance of thunderstorms or lightning strikes within 10 miles using weather advisories, Leadership will notify workers performing activities on top of roofs and on the ground, to place equipment into a safe condition and take immediate cover in a nearest building. Leadership and Industrial Safety will be notified of the actions taken. Work can resume when the lightning is outside the 10-mile range for a minimum of 30 minutes.
2. **Protect Our Assets** - All mobile lifting and material handling equipment operations SHALL STOP when thunderstorms or lightning is within 10 miles. All equipment shall be put in a safe condition until the “all clear” is communicated by Crane Operator/Leadership/Designees.

D. References

- Field Use of Rigging, 30DP-9MP11
- Mobile Crane Operation, 30DP-9MP10
- PVNGS Acts of Nature, 40AO-9ZZ21
- United States Department of Health & Human Services Centers for Disease Control and Prevention. (06/07/2022). To learn more, go to <https://www.cdc.gov/disasters/lightning/>

SECTION III MATERIAL HANDLING EQUIPMENT SAFETY

ARTICLE 1

Procedural References

A. General Information

1. For safety instructions for material handling of hand trucks, carts, forklifts (Industrial Power Trucks), and lift gates, refer to 30DP-9MP17, Material Handling.
2. When operating hand trucks and pushing carts (material handling equipment), discuss the task with your leader, and evaluate if gloves should be worn and what type of glove is needed. This evaluation should include:
 - Type of material the equipment being used is made of
 - Distance you will be going
 - Stability of load and if you will be touching or adjusting the load
3. For safety instructions for pallets made from combustible materials, refer to 14DP-0FP33, Control of Transient Combustibles.

SECTION IV TOOL SAFETY

ARTICLE 1

GENERAL TOOL PRACTICES

A. General

1. Inspect the equipment for indications of possible internal damage such as deformation of the cord cover, sharp bends in the cord, and looseness of the cord cover or any other conditions.
2. Defective tools shall be immediately removed from service.
3. New tools or equipment, which are significantly different in design or operation from those previously utilized, should be jointly evaluated by the 'user' department and the Industrial Health and Safety Department to ensure that manufacturer's manuals, recommendations and product warnings are reviewed and incorporated into initial and continuing training, as necessary.

B. Utility Knives/Cutting Tools

1. Only utility knives with self-retracting blades are approved for use at Palo Verde. No work activity constitutes the use of a personal pocket knife on Palo Verde property, and therefore such use is prohibited.

NOTE: A retractable knife shall retract whether a finger is on the switch or not when contact is lost on a surface.

2. All tools used for cutting activities shall be the specific cutting tool for the work being performed (trade tool provided by Palo Verde or via variance approved by Industrial Health and Safety Director [or designee]). If there is any doubt, discuss with your leader on which type of cutting tool to use for a specific job or contact site safety for consultation on the correct tool and applicable variance if necessary.
3. It is recommended cut-resistant sleeves with a minimum cut level of 3 be used if an individual's arm will be exposed to a cut hazard. Cut resistant temporary sleeves are available through the Tool Room and/or site PPE vending machines.
4. Sharps, i.e., utility knife blades, saw blades, and broken light bulbs shall be disposed of properly.

NOTE: Utility knives must be disposed of in scrap metal dumpsters or in blade disposal containers (APN 138144) that are located in numerous tool rooms on site. Tool rooms are located in the Service Building, Mobile Tool Room, Hot Machine Shop and Unit 2. Other sharp items, such as broken light bulbs and saw blades, must be disposed of in a manner that prevents injury to any person who may have exposure to the sharp items or to the person who will be collecting the sharp items for final disposal. Proper disposal methods include wrapping or boxing the sharp items.

ARTICLE 2

POWDER ACTUATED TOOLS

A. General

1. A powder-actuated tool is a type of nail gun used to join materials to hard substrates such as steel and concrete relying on a controlled burst created by a small chemical propellant charge.

2. Only those employees who are qualified by training shall use these tools.
3. Tool cartridges shall be carried and transported in approved containers.
4. Cartridges shall not be stored with flammable liquids.
5. Tool users shall be safeguarded by means of eye protection (safety goggles and face shields), along with hearing protection and hard hats.

B. Safe Work Practices for Powder Activated Tools

1. Prior to use, the operator shall ensure that the protective shield is properly attached to the tool.
2. Powder-actuated tools shall not be loaded until just prior to the intended firing.
3. Tools and cartridges shall not be left unattended.
4. Tools shall not be pointed at any person.

ARTICLE 3 **PRESSURE WASHERS**

A. General

1. During any pressurized water cleaning activity the correct operation and application of the pressurized water equipment is the responsibility of the operator.
2. Only personnel who have been trained and have demonstrated knowledge and skill of pressure cleaning equipment operation to their leader's satisfaction shall operate pressure water equipment.
3. Operators responsibility includes: Area set up and barricaded off (depending on the location and task). Ensure precautions have been taken to protect electrical equipment. Ensure all hoses and fittings are in accordance to the owner's manual. Inspect the conditions of all hose and fittings prior to operating. Ensure the filter on the pump suction is clean and in good operating condition.
4. Pressurized water cleaning systems shall include at least one valve that will allow the operator to rapidly shut down and depressurize the equipment by dumping the water to atmosphere. This valve shall be checked prior to each use (minimum once each shift). Defective valves shall be repaired/replaced prior to start of work.
5. Everyone working around pressurized water cleaning operations shall wear clothing to provide protection from water and debris that may be created. Personal Protective Equipment shall be evaluated and selected for each job condition.
6. Suitable barriers shall be erected to restrict access to the hazard area and signs shall be posted to warn personnel that they are entering a hazardous area. The barriers should be outside of the effective range of the jet wherever possible.
7. Electric powered pressure washers shall have GFCI protection in accordance with Section VI, Article 2.

ARTICLE 4

FIXED POWER TOOL PRACTICES

1. Machine tools shall be operated only by trained/qualified operators.
2. Employees shall not work on or around mechanical operating equipment while wearing neckties, loose clothing, watches, rings, or other jewelry. Badge and lanyard shall be secured. Gloves shall also be removed. When operating lathes, drill presses or milling machines, short sleeve or long sleeve shirts with sleeves rolled up and secured above the elbow with shirt tail tucked in shall be worn.
 - (a) If long sleeves are required to protect forearms while operating lathes, milling machines or drill presses, leader approval is required and the first 2-inches above the cuff shall be taped or secured using similar means. Gloves shall be worn while setting up or changing tools on the machine, but gloves shall not be worn while operating the machine.
 - (b) If a lathe, drill press or milling machine is operated in a Radiological Controlled Area where contamination Protective Clothing must be worn, a Job Hazard Analysis (JHA) is required to be completed. To prevent entanglement, consideration must be given to securing the loose fitting protective clothing and the use of thin style gloves that would break away easily.
3. Operators shall not reach through any openings in the housing of machine or power tool while in operation.
4. If the fixed machinery is not currently anchored, evaluate the possibility of the equipment to walk or tip over during operation. Based on the assessment results, anchoring of the machinery may be required and should be completed via the Corrective Action Program as appropriate. (CRAI 3634690)
5. The hazards of exposed cutting edges, sharp points, catch or pinch points, live electric parts or other moving or energized components shall be protected by guards, shields, covers, location, storage, and other appropriate means. All stored cutting blades, and other sharp pointed equipment shall be stored in a way or covered to prevent employee injury.
6. Prior to mounting a grinding wheel, it shall be checked to see that the spindle speed of the machine does not exceed the maximum operating speed indicated on the wheel.

ARTICLE 5

HAND TOOL PRACTICES

A. General Safeguards

1. Tools shall be inspected before, during, and after use.
2. When not in use, tools shall be stored properly and/or carried in a manner such that they do not present a hazard of falling and becoming a Dropped Item. The Leadership of each group shall determine if carrying any tool in a pocket is a prudent choice.

B. Specific Tool Precautions

1. Wooden handled hand tools to include hammers, shall be inspected prior to use. The inspection shall include examining for cracks, splinters, looseness, or signs of wear on the tool, and the handle of the tool that could compromise its integrity or your grip. If any of these are found, the tool shall not be used and disposed of.
2. If tools such as chisels, punches, drift pins, etc., become mushroomed or cracked, they shall be dressed, repaired or replaced before further use.
3. Pipe or other such material shall not be used to extend handles for added leverage unless the wrench was designed for such use.
4. Tools with sharp edges shall be stored and handled so that they will not cause injury or damage. They shall not be carried in pockets.
5. A file or rasp shall be equipped with a handle fitted and secured to the end designed to accept a handle, when in use. (CRDR 4336354)
6. When using a post driver, pre-use inspection is required to ensure you have the right tool for the job. The appropriate type and size post driver shall be used for the size and type of the post being driven. If you are in doubt on which driver to use, have a discussion with your leader on which post driver is appropriate for the job.
7. When a chain is used to secure a tool box or piece of mobile equipment, ensure one end is properly fastened/affixed to the tool/piece of equipment or the place you are securing to it. This will prevent a potential dropped item if the item is being stored on an elevated platform or on top of grating.

ARTICLE 6

PNEUMATIC AND HYDRAULIC TOOLS

A. General Safeguards

1. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.
2. Hearing protection shall be used by employees when operating any air power tool whose noise levels exceed 85 dBa.

B. Safe Work Practices

1. Pneumatic and Hydraulic tools shall be secured to the hose or whip by a positive means to prevent the tool from becoming accidentally disconnected. When using a pneumatic tool, whose air hose exceeds 1/2 inch inside diameter, a safety device (OSHA valve) shall be installed at the source of supply or branch line. (ACT 3017568)
 - (a) The OSHA valve needs to be the same size as the hose.
 - (b) For a continuous run of hose, regardless of length, a single OSHA valve is needed at the source.
 - (c) Hoses attached to a manifold are considered branch lines and require their own OSHA valve.
 - (d) When joining two or more hoses together to make a longer hose, each added section is considered a branch line and requires its own OSHA valve.

- (e) Per the manufacturer's instructions, the OSHA valve must be tested daily, prior to use by using a ball valve at the far end of the hose, opening it quickly to simulate a hose failure. This action will allow the OSHA valve to actuate and should automatically reduce the air flow to the hose.
- (f) If there are multiple OSHA valves in a system, each must be tested individually.

NOTE: OSHA valves should be installed on air hoses exceeding 1/2 inch inside diameter when such hoses are used with pneumatic powered **equipment**, including breathing air hoses, as long as the valve does not interfere with **equipment's** operation. (ACT 3017568) If an OSHA Valve cannot be used, other methods such as whip restraints shall be used and documented on a Job Hazard Analysis (JHA).

ARTICLE 7

FUEL POWERED TOOLS

A. General

1. A fuel-powered tool shall be stopped and allowed to cool prior to being refueled, serviced or maintained.
2. Where refueling is done with a portable container, the container shall be an approved safety can with an automatic closing cap and flame arrester.

ARTICLE 8

PORTABLE AND VEHICLE MOUNTED GENERATORS

A. General Information

1. Portable and vehicle mounted generators provide necessary temporary electrical power for numerous work-related activities, such as tasks in remote areas where permanent electrical power is unavailable during power outages and emergency situations. However, they can pose significant hazards to the health and safety of workers if not used or installed correctly.
2. This section shall apply to all portable generators used at the station, either owned by Palo Verde, owned by contractors providing temporary services or rented.
3. This section shall also apply to engine powered portable welders and lighting units that are equipped with a built-in generator that provides temporary power through receptacle outlets for use by employees.

NOTE: For the purpose of this section, a "vehicle" is defined as any motorized or non-motorized means of transportation used for personnel and/or materials to include pick-up and other types of trucks, trailers, skids, cranes, carts, etc.

B. Authorized Portable Generators

1. Shall be equipped with grounding type receptacle outlets, either 3-wire or 4-wire, however larger portable generators may be equipped with hardwired terminal connections.
2. Shall have all non-current carrying metal parts of the frame electrically bonded to the receptacle outlet's equipment grounding conductor (EGC).

3. Shall have all non-current carrying metal parts of the frame electrically bonded to the generator's neutral winding. This can be confirmed by a label stating "**NEUTRAL BONDED TO FRAME**" or equivalent. The label shall be affixed to the authorized generator, legible and durable for the environment.
 - (a) Portable plug-in types of bonding devices, either procured such as the "Hughes Ground Neutral Plug" or similar products or shop made bonding plugs, shall not be used and are not permitted as the means to bond the generator's neutral to its frame.
 - (b) The neutral bond shall be a permanent connection of the correct conductor size.
 - (c) If unsure whether the generator's neutral is properly bonded to the frame, Do Not Use and contact Industrial Safety for assistance.
 - (d) If the portable generator is permanently mounted to a vehicle, then the EGC and the neutral bonding conductivity shall also extend to the vehicle's frame.

C. Prohibited Portable Generators

1. 120 volt two-wire type single-phase portable generators.
2. Portable generators where the neutral winding IS NOT electrically bonded to the metal frame. This can be confirmed by a label stating "**NEUTRAL FLOATING**" or equivalent.
 - (a) If a generator with a Neutral Floating is discovered or suspect, Do Not Use and contact Industrial Safety for assistance.
3. Generators with missing guards, damaged parts or unauthorized modifications.

D. General Safety Practices

1. Prior to use, thoroughly inspect the generator for damage, leaking fuel, fuel cap tight, broken outlets, missing guards, etc.
2. Operate and store portable generators on firm and dry level surfaces.
3. Portable generators shall not be modified in any way without prior written approval from the Industrial Safety department.
4. Portable generators shall be used in accordance with any additional safety requirements or prohibitions contained in its listed and labeled instructions.

E. Electrical Hazards

1. 120 and 240V extension cords and temporary electric equipment shall be used in accordance with Section VI, Article 1.
2. 480V extension cords and temporary electrical equipment shall be used in accordance with 30DP-9MP21, *General Requirements for 480V Temporary Power Installations*.
3. Ground Fault Circuit Interrupters (GFCI) shall be used in accordance with Section VI, Article 2 and/or 30DP-9MP21.
4. Loads connected to the generator shall not exceed its wattage capacity.

5. Do not use generators in wet conditions or environments, such as rain, mist from cooling towers/spray ponds, unless the manufacturer's instructions permit such use.
6. Turn off all loads before shutting down the generator or unplugging extension cords or portable electric equipment.
7. Generators shall not be used to energize structures or buildings containing permanent electrical services unless an appropriate transfer switch is installed.
8. Portable generators should be grounded/earthed (connected to the station's ground grid or earthed via a ground rod) unless the manufacturer's instructions mandates grounding/earthing, at which time it shall be required.

F. Carbon Monoxide (CO) Hazards

1. Portable generators shall never be used indoors or within other fully or partially enclosed areas, regardless of ventilation.
2. Portable generators with internal combustion engines, shall be operated outdoors as far away as practical from workers, buildings and other permanently or temporarily occupied structures. A minimum distance of 25 feet shall be maintained from buildings, doors, windows, crawl spaces, open pits, or ventilation intakes to prevent carbon monoxide and exhaust fumes from entering the locations. If trying to maintain this 25' distance, introduces additional employee hazards or cannot be achieved, contact the Industrial Safety group for guidance.
3. Personnel working in close proximity to operating generator for an extended amount of time should consider using portable battery-operated gas meter with carbon monoxide detector and alarm.

G. Fire and Burn Hazards

1. Never add fuel, handle or move the generator while running or hot.
2. Add fuel only when it is cool to the touch.
3. Do not use in areas where flammable vapors, gases or dust may be present.
4. Do not operate generator in close proximity to combustible or flammable materials, such as fuel containers, tall grass, flammable liquids or gases, oily rags, cardboard boxes, etc.
5. Ensure the generator has clear spaces above and around all sides necessary for engine cooling.

H. Vibration and Rotating Parts Hazards

1. Ensure portable generators are properly secured so they do not "walk" due to vibration.
2. Ensure all guards are in place and all rotating or moving parts are adequately protected from accidental contact.

ARTICLE 9

PORTABLE ELECTRIC HAND TOOLS AND EQUIPMENT

A. General Safety Practices for Cord and Plug Connected and Cordless Battery-Operated Portable Hand Tools

1. Prior to use, inspect the tool for damage such as but not limited to frayed cable jackets, exposed wires, lack of cable strain relief, missing guards or parts, sticking switches, faulty interlocks, cracked housing, leaking batteries or other safety anomalies.
 - All damaged tools shall be removed from service, workgroup leader informed of the issue and a tag attached warning “DO NOT USE.”
 - Damaged tools shall be repaired by personnel or organizations who are authorized and qualified to make any necessary repairs. If uncertain of who is authorized or not, contact Industrial Safety for assistance.
2. Portable electric hand tools and equipment shall be used in accordance with its listed and labeled instructions and all safety instructions provided by the manufacturer.
3. Proper PPE to protect the specific part (s) of the worker’s body from the various hazard(s) shall be correctly worn in accordance with 01DP-0IS19, Personal Protective Equipment (PPE).
4. Cord and plug connected portable hand tools shall be either of the grounded type (three prong male plug) or double insulated. A double-insulated electric tool can be identified by this symbol:



Double insulated symbol

- Ground Fault Circuit Interrupter (GFCI) protection shall be used with both grounded type and double-insulated electric tools in accordance with Section VI, Article 2, Part I, however, “Mag Drills” may be exempted from GFCI protection with adequate justification.
 - For Mag Drills exempted from GFCI, a variance shall be completed in accordance with Section 1, Article 5 with the implementation of the Assured Equipment Grounding Conductor Program (AEGCP) in accordance with Section VI, Article 2, Part II.
- Extension cords used with cord and plug connected electric tools shall be in accordance with Section VI, Article 1.
- When unplugging the tool from an outlet, pull the plug not the cord.

5. Whenever portable electric tools are left unattended, being stored, transported or when servicing, changing blades, bits or making adjustments, the tool shall be unplugged from the power source for cord and plug connected type of tools or the battery removed from cordless battery operated tools and any residual power eliminated.
6. Do not use portable electric tools or equipment (including double-insulated or battery operated) in wet environments or outdoors during rain.
7. Do not lift, hoist or carry portable electric tools by the cord.
8. If equipped with factory equipped machine guarding, ensure it is in place, working correctly and no parts are loose.
 - Machine guarding shall not be removed or modified.
9. When clamping is needed to prevent movement, clamp the work and not the portable electric tool.
10. Batteries shall be charged in accordance with the instructions provided by the manufacturer.

SECTION V MATERIAL SAFETY

ARTICLE 1

MATERIAL HANDLING AND STORAGE PRACTICES

A. Loading and Unloading Trucks at the Dock

1. Employees shall not place skids or materials near the edge of the platform or loading dock. Allow a working space of approximately 12” between the edge of the dock and the material.
2. Trucks shall be backed flush against the dock, the brakes set, and wheels chocked.
3. Materials shall be either passed from one person to another or carried in and out of the truck. It shall never be tossed or thrown.
4. Items of unusual size and shape shall be secured before movement.

B. Handling Barrels and Drums

1. To roll a drum or barrel, workers shall push against the side with the hands. They shall not grasp the end of the drum nor use their feet to push the drum or barrel to change direction of the roll.

C. Wire

1. When cutting a long length of wire with bolt cutters or pliers, secure both ends to prevent the wire from springing back. If a short piece of wire is to be cut off the coil, secure the end which is left on the roll to prevent springing.

D. Handling Conduit and Pipes

1. Pipes, conduits, reinforcing rods and other conducting material shall not be carried on the shoulders near exposed live electrical equipment or conductors.

E. Material Storage

1. Maximum safe floor loads shall not be exceeded.
2. All materials stored in tiers shall be tacked, stacked, blocked, interlocked or otherwise secured to prevent sliding, falling or collapse.
3. Designated aisles and passageways shall be kept clear approximately 3 feet to provide for the free and safe movement of material handling equipment and employees.
4. Barrels and drums shall be stored on end or securely blocked to prevent rolling.
5. When storage under or near energized lines or equipment is necessary, proper safe zone clearances shall be maintained and extreme care shall be taken when moving materials into and out of such storages. Contact Electrical Maintenance for determination of safe zone clearance.
6. Materials such as piping, metal bars and strips that are kept in racks shall not protrude into aisles and walk areas.
7. There shall be no storage of materials in stairwells or under stairs.

F. Lab Safety Practices

1. Do not eat or drink in the laboratory. Wash hands thoroughly with soap and water before drinking or eating.
2. Laboratory refrigerators shall not be used to store foods.
3. Laboratory utensils shall not be used for eating or drinking.

ARTICLE 2 DROPPED ITEM PREVENTION PLAN

A. General

1. This section outlines the basic requirements of leadership and front line employees to develop a Dropped Item Prevention Plan. It is vitally important for anyone working at heights to properly secure tools and other objects so they won't become dropped items. As defined a dropped item is any item, capable of causing injury, which drops and escapes the first level of containment/control to the next level below them.
2. Industrial Health and Safety SHALL decide whether or not a dropped item was capable of causing injury. If determined to be a dropped item, the Industrial Health and Safety Department shall be provided with the weight of the dropped item and the distance it was dropped. The work group supervisor of the affected organization shall generate an EventWay notice and Condition Report.

B. Responsibilities

1. Site Management: Has a responsibility to ensure sufficient resources are available to develop, implement and maintain the Dropped Item Program. Specifically, Site Management is responsible for:
 - (a) Promoting the Dropped Item Prevention Plan to all site personnel
 - (b) Providing leadership and support for the plan and
 - (c) Communicating the expectations of the Dropped Item Prevention Plan
2. Front Line Leaders: Front line leaders (typically team leaders and section leaders) have the responsibility to ensure that all employees under their direct supervision have the resources to perform their work safely. The leader is responsible for:
 - (a) Monitoring work locations to ensure compliance with the Dropped Item Prevention Plan
 - (b) Ensuring that all hazards that could contribute to a dropped item event have been eliminated
 - (c) Evaluating work locations for changing conditions
 - (d) Engaging employees during pre-job briefs in discussion of the requirements of the Dropped Item Prevention Plan
 - (e) Regularly checking on new employees until you are comfortable such workers can properly follow and adhere to the established Dropped Item Prevention plan
 - (f) Educating employees on dropped item prevention tools
 - (g) Developing enough barriers to reasonably interrupt the normal course of events that would lead to a dropped item when working at heights or above grating
 - (h) Continually throughout the shift, inspecting working areas to ensure worker compliance with dropped item prevention tools and techniques
 - (i) Making available and ensuring the use of tool lanyards when there is a possibility of

working outside a barrier at heights or above grating

3. All personnel:
 - (a) Accepting individual responsibility for their own safe behaviors
 - (b) Maintaining a pro-active role in the implementation of the Dropped Item Prevention Plan
 - (c) Complying with the requirements of the Dropped Item Prevention Plan to ensure a safe work place
 - (d) Maintaining control of tools and materials to prevent items from falling
 - (e) When working with small equipment, screws, bolts, nuts, etc., ensuring dropped item prevention barriers are in place prior to performing work
 - (f) Constantly monitoring and inspect the work area for additional dropped item barriers
 - (g) Using tool lanyards when working at heights, i.e. working on or in scaffold, scissor lift, ladders, JLG, buckets, etc. and when working above personnel

C. Material Handling

1. When passing material, then employees shall use the “twist method.”
2. All material shall be raised or lowered using an approved bag. These bags shall be made of canvas or like material meant for raising and lowering materials.
3. Plastic containers (e.g., buckets, pails, etc.) shall not be used to raise/lower material, however, such containers may be used for transporting tools and equipment to and from work locations.
4. Never carry items when climbing ladders. Instead ensure materials are raised and lowered using appropriate containers.

D. Overhead Work

1. It is the responsibility of all employees working overhead to protect all personnel and equipment below them from overhead hazards.

E. Storage

1. Where equipment and material are commonly stored, the use of sheet metal, fire cloth, herculite, etc., shall be used to prevent small items from falling through grating.

F. Worksite Evaluations

1. Use the two-minute drill to evaluate your workplace for dropped item hazards.
2. Ensure that scaffold has netting and toe boards, if appropriate.
3. Inspect work areas for gaps that tools and materials could fall through.
4. Check tarps and fire blankets for hidden tools or materials that could drop.
5. Ensure that tool lanyards are attached to all tools and materials as required.
6. Notify personnel below of any activity where there is a potential for a dropped item.

7. Determine if overhead protection should be installed in your workplace.
8. Ensure that all tools and materials be kept to a minimum and in a bucket or secured.

G. Tool Lanyard Safety

1. In situations where tooling weighs more than 3 pounds, evaluate alternative approved attachment points other than your person.

ARTICLE 3 COMPRESSED GAS CYLINDER STORAGE AND HANDLING PRACTICES

A. General

1. Serious accidents may result from the misuse, abuse or mishandling or improper storage of compressed gas cylinders. Employees shall handle and store compressed gas cylinders so as to not create a toxic or explosive atmosphere in the work area.
2. Compressed gas containers, cylinders, tanks, and systems shall be secured against accidental dislodgement and against access by unauthorized personnel. (NFPA 55, 63.3.1.9.1)
3. Compressed gas containers, cylinders, tanks, and systems that could be exposed to physical damage shall be protected. (NFPA 55, 63.3.1.4.1)
4. Securing Compressed Gas Containers, Cylinders, and Tanks. Compressed gas cylinders, containers, and tanks in use or in storage shall be secured to prevent them from falling or being knocked over by corraling them and securing them to a cart, framework, or fixed object by use of a restraint. (NFPA 55, 63.3.1.9.5)
5. Compressed gas containers, cylinders, and tanks containing flammable liquefied gas, except those designed for use in a horizontal position and those compressed gas cylinders, containers, and tanks containing non-liquefied gases, shall be used in a "valve end up" upright position. (NFPA 55, 63.3.3.1.6.1)
6. All cylinders with a water weight capacity of over 30 pounds (13.6 kg) shall be equipped with means of connecting a valve protection cap or with a collar or recess to protect the valve. (OSHA 1910.253(b)(1)(iv))
7. Valve protection caps, where cylinder is designed to accept a cap, shall always be in place, hand-tight, except when cylinders are in use or connected for use. (OSHA 1910.253(b)(2)(iv))
8. Only non-sparking tools shall be used when working with flammable gas cylinders. (CRAI 3196942)

NOTE: Duster and other brands of compressed gas (small disposable cans), used to clean computers or other electronic equipment are exempt from the requirements of this section.

9. Damaged or leaking cylinders shall not be used but returned to the manufacturer for repairs as soon as possible.
10. Cylinders shall have their contents properly identified with a Chemical Use Permit (CUP) label.

11. A sign “Danger - No Smoking” shall be posted where oxygen or flammable gases are used or stored.

B. Storage Practices

1. Compressed gas cylinders, whether full or empty, whether in storage or in use, shall be stored in a protected, well-ventilated area and secured in an upright position such that they cannot fall or be upset. They shall not be secured to safety-related structures or components. The requirement for upright storage does not apply to cylinders containing breathing air or dewars. (CRDR 3672730)
2. Compressed gas cylinders shall not be stored in the proximity of combustible materials, furnaces, radiators, etc.
3. Compressed gas cylinders shall not be stored inside of a flammable liquid storage cabinet. (CRAI 3377354)
4. Oxygen cylinders shall not be stored near highly combustible material, especially oil and grease; or near reserve stocks of carbide and acetylene or other fuel-gas cylinders, or near any other substance likely to cause or accelerate fire; or in an acetylene generator compartment.
5. Smoking, welding, or open flames are prohibited in the vicinity (20') of stored Oxygen and/or fuel Gas Cylinders or bulk storage areas.
6. Oxygen cylinders in storage shall be separated from fuel/gas cylinders or combustible materials (especially oil or grease) a minimum distance of 20 feet or by a 5 foot high non-combustible barrier having a fire-resistance rating of at least one-half hour.
7. Containers and Cylinders of Less than 1.3 Gal (5 L). Containers with a capacity of 1.3 gal (5 L) or less shall be permitted to be stored in a horizontal position. (NFPA 55, 63.3.2.1.2.1)

C. Handling Practices

1. Always consider cylinders as being full and handle them with corresponding care. Ensure personnel have the appropriate gloves for the task.
2. Cylinders may be rolled on their bottom edge but never dragged. Cylinders weighing more than 40 pounds (18.2 kg) (total) shall be transported on a hand or motorized truck, suitably secured to keep them from falling.
3. When compressed gas cylinders are to be transported in vehicles, they shall be kept in the upright position. Valve protection caps shall not be used for lifting cylinders. Do not transport cylinders in closed vehicles.
4. When empty cylinders are to be returned to the vendor, tag them EMPTY. Close the valves and replace the valve protection caps, if the cylinder is designed to accept a cap.
5. Make sure the threads on a regulator or union correspond to those on the cylinder valve outlet. Do not force connections that do not fit.
6. Do not use a cylinder of compressed gas without a pressure-reducing regulator attached to the cylinder valve, except where cylinders are attached to a manifold, in which case the regulator will be attached to the manifold header.

7. Use regulators and pressure gauges only with gases for which they are designed and intended. Do not attempt to repair or alter cylinders, valves, or attachments. This work shall be done only by the manufacturer.
8. Never use oil or grease as a lubricant on valves or attachments of oxygen cylinders. Keep oxygen cylinders and fittings away from oil and grease, and do not handle such cylinders or apparatus with oily hands, gloves, or clothing.
9. Compressed gas cylinder valves shall be closed upon completion of work and prior to moving the cylinder. Before a regulator is removed from a cylinder valve, close the cylinder valve and release the gas from the regulator.
10. Never bring cylinders into tanks, unventilated rooms, or other closed quarters.
11. When recharging bulk systems with hydrogen or other gases, delivery trucks shall be properly grounded and care taken to eliminate sparks or other sources of ignition.
12. Compressed gas cylinders can be transported in an elevator. The compressed gas cylinder valve must be in the off position with no leakage and with the valve protection cap on if the cylinder is designed to accept a cap.

D. Cryogenic Liquid Containers

1. Leather or insulated gloves and other protective clothing shall be worn when operating valves or when the potential exists for contact with product or exposed cold piping. This includes long cuffless pants, long sleeved shirt, safety glasses and full face shield.
2. Care must be exercised when transporting cryogenic liquid containers in elevators. After the container is placed in the elevator, the container shall be secured in the elevator and a sign placed on the container / cart stating "Danger, Do Not Enter". Red Danger tape shall also be placed across the entrance of the elevator, with a sign stating "Danger, Do Not Enter". Additionally, a Job Hazard Analysis (JHA) shall be completed prior to performing this task. The sender shall remain outside the elevator and activate it. No one shall ride in the elevator while the cryogenic liquid container is in the elevator. (CRDR 3825139 / CRAI 3895909)

ARTICLE 4

COMBUSTIBLE AND FLAMMABLE LIQUIDS STORAGE AND HANDLING

1. Personnel and plant safety is enhanced through the effective control of combustible and flammable materials by minimizing the amount of combustibles that an area may be exposed to during normal operations, maintenance, and refueling outages. The control of these combustible and flammable materials is through specific regulation of storage, handling, transporting, and disposal of combustible materials. 01DP-0FP01, *Control of Flammable/Combustible Liquids Storage Cabinets*, 14DP-0FP33, *Control of Transient Combustibles*, and 01DP-0AP61, *Chemical Control Program* shall be used for guidance. (AI 21-12493-002)

SECTION VI ELECTRICAL SAFETY

ARTICLE 1

TEMPORARY ELECTRICAL SUPPLY/EXTENSION CORD USAGE

A. Extension Cord and Temporary Wiring General Safety Practices (CRDRs 3076515, 3097356)

1. This section applies to all extension cords used at PVGS at voltages less than 480 volts.
 - For 480 volt equipment, refer to 30DP-9MP21, General Requirements for 480V Temporary Electrical Power Installations.
2. All extension cords used at PVGS shall be installed, used and assembled/fabricated in accordance with applicable OSHA regulations, the National Electric Code (NEC) and industry consensus standards.
 - Extension cords and temporary electrical equipment shall also be installed and used in accordance with its listed and labeled limitations (UL, CSA, ETL, etc.) and manufacturer's instructions.
 - Whenever extension cords and temporary electrical equipment is procured outside of the station's supply chain sourcing, any listing and labels identification from a Nationally Recognized Testing Laboratory (NRTL) such as UL, CSA, ETL, etc. shall be verified to be genuine to ensure it is not a counterfeit.
3. Extension cords and temporary wiring and lighting equipment are of a class less than would be required for permanent installations making them more vulnerable to damage and increasing the risk of electric shock to employees.
4. When extension cords and cables are installed in Quality Related locations and buildings, refer to 30DP-0WM12, Housekeeping for additional installation limitations and criteria.
5. When extension cords and cables must be run through doors, plant related hatches, and floor plugs, refer to 40DP-9ZZ17, Control of Doors, Hatches and Floor Plugs, for additional limitations and criteria.
6. Only three wire extension cords with an equipment grounding conductor (EGC) are authorized for use at PVGS. Two wire extension cords are prohibited.
7. The minimum wire size of extension cords shall be 14 AWG or larger; however, 12 AWG is preferred.

APNs for 12 AWG extension cords:

- APN 43230218 = 50 ft. long
- APN 43230217 = 100 ft. long

8. Only qualified individuals may repair, rework or fabricate extension cords. If an extension is to be fabricated, all materials used shall be used in accordance with its listed and labeled instructions for this specific application, e.g. metal receptacle boxes shall not be used, etc. (CRDR 3511602)
 - All male and female plugs installed to extension or portable equipment cords shall maintain the correct NEMA configuration for the specific voltage and/or current rating of their specific design.
9. All extension cords or portable equipment cords shall be sized correctly to safely carry the load to prevent overloads. The Electrical Safety Foundation International (ESFI) establishes the following maximum current (ampere) limitations for the length and AWG wire size of the cord:
 - Up to 50 feet
 - 14 AWG (14 – 15 amps)
 - 12 – 10 AWG (16 – 20 amps)
 - 51 to 100 feet
 - 14 AWG (11 – 13 amps)
 - 12 AWG (14 – 15 amps)
 - 10 AWG (16 – 20 amps)
 - Up to 150 feet
 - 14 AWG (1 – 7 amps)
 - 12 AWG (8 – 10 amps)
 - 10 AWG (11 – 15 amps)
10. All factory assembled extension cords shall be approved by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratory (UL).
11. All extension cords shall be GFCI protected in accordance with Article 2.
12. Extension and flexible cords shall be equipped with strain relief to prevent pull from being transmitted to the wire terminals.
13. Extension cords shall not remain energized and installed or used for greater than 180 days (6 months).
 - If a work-related need exists to support plant operations for a time period greater than 6 months, then the work group or organization shall be responsible for initiating and sponsoring a plant modification, commercial change or other approved methods to have a permanent power source installed at the location of need in a timely manner.
 - Once the responsible work group or organization has initiated the documentation for the installation of permanent power, a written request shall be submitted to the Industrial Safety Director or designee, to have the extension cord(s) remain in place for a longer time period until the permanent power has been installed. Industrial Safety may grant a conditional time extension on a case-by-case basis.

14. All energized in-service portable cord and plug connected equipment and extension cords shall be visually re-inspected for deterioration and damage every 60 days at a minimum until the final 180 days (6 month) duration has been reached according to step 12.
 - The 60-day re-inspection shall be documented by a new Work In Progress tag affixed to the temporary equipment or extension cord or the existing Work In Progress tag, if in good condition, can be updated with the new inspection date.

B. Prohibited Use and Unsafe Practices

1. Extension cords and cables shall not be used for the following:
 - (a) As a substitute for the fixed wiring of a structure or in place of permanent wiring.
 - (b) Where run through holes in walls, structural ceilings, suspended ceilings, dropped ceilings or floors that are not designed for this purpose.
 - (c) Where concealed by walls, floors, carpets or ceilings or located above suspended or dropped ceilings.
 - (d) Where installed in active raceways and cable trays.
 - (e) In areas or locations where subject to physical damage, e.g. sharp corners, hot surfaces, heat sources, vehicular traffic, etc.
 - (f) Connected to or fed from a Power Strip (Re-locatable Power Tap [RPT]).
2. Extension cords are permitted to be run through doorways, windows or similar openings but only when protection from damage is provided.
3. Adapters that interrupt the continuity of the equipment grounding conductor (EGC) shall not be used.
4. Extension cords shall not be overloaded, i.e. powering equipment which draws more current than the rating of the cord.
5. Extension or electric cords connected to equipment shall not be used for carrying, raising or lowering the equipment.
6. Electrical tape, heat shrink (Raychem), or other means shall not be used to repair damaged cords.
7. Damaged extension cords shall not be used and shall be properly repaired by a qualified person using the correct components or disposed of.
8. Adapters that modify or change the NEMA design for the specific voltage and/or current rating between the power source outlet and connected load equipment plug increase the risk of fire and electric shock. Such unsafe devices are prohibited and shall not be used without written authorization from the Industrial Safety Director prior to use.
 - For example: adapters that allow 120V/30A load equipment to be physically connected to a 120V/15A or 20A receptacle outlet source, etc. are prohibited.

9. Extension cords shall not be routed through suspended ceilings containing plenum spaces.

C. Extension Cord Safety Practices

1. The user shall visually inspect the extension cord prior to installation and before each use for the following:
 - (a) External signs of damage, excessive wear or defects.
 - (b) Loose, broken or missing male ground prong.
 - (c) Signs of overheating or discoloration.
 - (d) Exposed wires or lack of strain relief at the connectors.
 - (e) Pinched or crushed outer cable jackets which could hide internal damage.

If any signs of compromise are discovered during the inspection it shall not be used and immediately taken out of service.

2. Extension cords and cables shall not be placed across pedestrian or vehicular traffic areas without the use of adequate cord protectors.
3. Whenever possible, route extension cords overhead using securing means which will not damage the cable's jacket, e.g. tie wraps, rope, etc.
4. Extension cords shall be routed away from wet areas and water as much as practical.
5. Extension cords no longer in use shall be unplugged and removed from the area by the end of shift.
6. Ensure extension cords are fully plugged into the receptacle outlet.
7. All extension cords installed greater than 1 shift shall be tagged at the source end with an orange "Work In Progress" tag (CU-210508) containing at a minimum:
 - (a) Name and valid phone number of the responsible supervisor
 - (b) Date and duration of the installation
 - (c) Any applicable work order numbers or other information

NOTE: Extension cords installed in Quality Related areas under the scope of 30DP-0WM12, Housekeeping and are identified by Specification 13-EN-0700 Compliance Tags are not required to have an additional Work In Progress tag.

8. Consideration should be given for the use of connector protectors such as the "Twist and Seal Maxx" or similar, when extension cords are used with electric tools or when installed outdoors or in damp/wet areas.
9. Extension cords and temporary electrical equipment shall be installed and used in accordance with its listed and labeled and manufacturer's instructions and limitations.
10. When unplugging extension cords and devices equipped with cord and plugs, pull the plug and not the cord.
11. Do not plug or unplug cords when they are wet or when the hands are wet.

D. Power Strips (Re-locatable Power Taps [RPTs]) Safety Practices (CRDR 3685752)

1. Power strips shall be directly connected to a permanently installed receptacle outlet. They shall not be series-connected (“Daisy Chained”) to other power strips or connected to extension cords.
2. Power strips are not designed for high power loads such as refrigerators, microwave ovens, etc. They shall only be used with low power loads such as computers, their peripherals (e.g. printers, monitors, etc.), phone chargers, audio/video equipment, etc.
3. Power strips shall not be used outdoors or for construction or industrial maintenance activities.
4. The user shall visually inspect the power strip prior to installation and before each use for the following:
 - (a) External signs of damage, excessive wear or defects.
 - (b) Loose, broken or missing parts, especially the male ground prong.
 - (c) Signs of overheating or discoloration.
 - (d) Exposed wires or lack of strain relief at the connectors.
 - (e) Pinched or crushed outer cable jackets which could hide internal damage.

If any signs of compromise are discovered during the inspection it shall not be used and immediately taken out of service.

5. Long term “in use” power strips should be periodically inspected by the user.

ARTICLE 2

120/240 VOLT GROUND FAULT CIRCUIT INTERRUPTERS (GFCI)

PART I

A. Purpose

GFCI protection lessens the dangers from electrical shock hazards to employees using extension cords, electric tools, test equipment, etc. (CRDR3580110, CRAI 3580113).

CAUTION: GFCIs do not protect personnel from shock hazards where contact is made between phase-to-neutral or phase-to-phase conductors.

1. Approved GFCI protection shall be UL listed and provided by one of the following:
 - (a) Permanently wired GFCI receptacle outlets.
 - (b) Receptacle outlets protected by GFCI breakers.
 - (c) Portable GFCI “pig tails” devices rated for wet/outdoor use.
 - APNs for 120 Volt GFCI “pig tails”:
 - APN 122647 = 120V/15 Amp single outlet
 - APN 122648 = 120V/20 Amp single outlet
 - APN 122649 = 120V/15 Amp triple outlet
 - (d) Tools or extension cords equipped with built in “hard wired” permanent GFCI devices rated for wet/outdoor use.

2. Application - GFCI protection shall be used with:

- (a) All extension cords and installed at the source end of the cord.
- (b) Portable electric tools and devices such as pumps, drills, saws, hand grinders, pressure washers, drop lights, vacuum cleaners, industrial sized fans (excludes small personal fans used in offices), portable HVAC equipment, welders, battery chargers, test equipment (including but not limited to breaker test sets, oscilloscopes, multi-meters, timers, power supplies, etc.) and portable monitoring equipment (including but not limited to RM-3 friskers, video monitors, recorders, video cameras, Continuous Air Monitors, etc.) regardless if they are “Double Insulated” or not.
- (c) Computers, laptops, their associated peripherals, kitchen appliances and uninterruptable power supplies (UPS) are required to be GFCI protected (input and output sides of UPS) when used in industrial environments outside of permanent conventional indoor office locations.
- (d) Whenever electrical power is derived from portable generators.
- (e) Whenever electrical power is used in damp or wet environments or used outdoors.

EXEMPTION: Equipment which is not compatible with GFCI protected circuits or if using GFCI protection would create a greater hazard if power is interrupted may be exempted from GFCI requirements through the implementation of the Assured Equipment Grounding Conductor Program (AEGCP) in accordance with Part II.

3. Usage, Inspection and Testing shall be conducted prior to each use as follows:

- (a) Inspect the GFCI receptacle outlet or device for any signs of damage.
- (b) Test the GFCI prior to use by following the testing sequence below. A UL approved GFCI tester may be used during the test.
 - Push the “RESET” button to prepare the unit for testing.
 - Plug a piece of electrical equipment (a light is suggested) into the GFCI circuit and turn it on. The equipment should go on.
 - Push the “TEST” button and verify it trips off. The equipment should go off.
 - Push the “RESET” button again and ensure the trip clears. The equipment should go on again.

CAUTION: If any damage is observed or if the GFCI fails the test, DO NOT USE and immediately remove it from service.

WARNING: The “TEST/RESET” button shall not be used as an “ON/OFF” control switch to energize or de-energize equipment unless the buttons are specifically marked “ON” and “OFF”.

PART II

ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM (AEGCP)

A. Purpose

1. A written AEGCP has been established which shall be continuously enforced at PVGS to allow station personnel flexibility from mandatory GFCI protection as outlined in Part I under any of the following limitations:
 - (a) When certain electrical/electronic equipment which by design is not compatible with GFCI protection,
 - (b) Where the use of GFCI protection would create a greater hazard to personnel if electrical power were interrupted, e.g. breathing air compressors,
 - (c) When a GFCI of the correct voltage and current rating is not available.
2. The AEGCP is valid for 6 months (180 days) from the date of the inspection or 90 days when used or located in harsh locations where it may be prone to damage, such as high vehicular traffic areas.
3. The AEGCP is only required while the equipment is in service and when GFCI protection is not used.
4. Supervision at Team Leader level or greater of the work group requesting the AEGCP shall:
 - (a) Verify and approve any exemption from GFCI protection is valid on a case-by-case basis.
 - (b) Obtain concurrent written approval from the Industrial Safety Department that GFCI protection cannot be used for any of the limitations as listed in step A.1.
 - (c) Ensure only a qualified electrical worker(s) implements the AEGCP in lieu of GFCI protection.
 - (d) Ensure all AEGCP inspection and testing results are properly documented in the AEGCP log (Appendix A).
 - (e) Ensure the AEGCP log is retained by their responsible work group for the entire duration the equipment is in service.
 - (f) Be responsible for maintaining the completed AEGCP log (Appendix A) as the “Official Record” for their work group. It shall be made available for inspection by OSHA/ADOSH inspectors and any employee upon demand as required by OSHA 1910.304(b)(3)(ii)(C)(6).
5. The person performing AEGCP Shall:
 - (a) Be a Qualified Electrical Worker.
 - (b) Verify all equipment to be tested IS NOT ENERGIZED prior to performing the AEGCP. This will not apply to the source receptacle outlet identified in step 5.d.
 - (c) Visually inspect each cord set, attachment caps, plugs and receptacles of the cord set(s) and any equipment connected by the cord and plug for damage.
 - If any damage is discovered, the damaged equipment shall be removed from service and disposed of.
 - (d) Ensure the equipment grounding conductor (EGC) at the source receptacle outlet is present and is correctly bonded to the grounding system.
 - (e) Ensure the EGC at the plugs is correctly attached to its proper terminals, is not loose and free of corrosion.

- (f) Use a Digital Volt/Ohm Meter (DVOM) to test all EGC's and terminals for continuity (≤ 1 ohm) and verify they are electrically continuous and bonded through the entire circuit to include all cord sets and the metal housing of all connected load equipment, from the source to the final load equipment.
- (g) Ensure the required inspection and testing is performed before first use, before equipment is returned to service following any repairs, after any incident which can reasonably be suspected to have caused damage and at intervals not to exceed 3 months (90 days) or 6 months (180 days) according to step A.2.
- (h) Ensure all inspections and testing results are properly documented in the AEGCP log (Appendix A).
- (i) Use permanent ink marker to legibly complete the "Assured Equipment Grounding Conductor Program (AEGCP) Implemented" Tag (Appendix B) then affix it at the source end (AEGCP Tag APN 00165647).
- (j) Provide the responsible supervisor or manager with the completed copy of the AEGCP Log (Appendix A) for retention per step 4.F.
- (k) Stop and contact their leaders and Industrial Safety if any unexpected conditions or discrepancies are noted during the performance of the AEGCP inspection and testing.

ARTICLE 3

OVERHEAD ELECTRIC POWER LINES/EXPOSED ENERGIZED EQUIPMENT

1. When using cranes or similar mobile equipment near overhead electric power line and/or exposed energized equipment, refer to 30DP-9MP10, Mobile Crane Operation and 30DP-9MP13, Commercial Truck Mounted Cranes and Aerial Lifts for details. (CRDR 3449394)
2. Refer to 01DP-0IS13, Palo Verde Generating Station Electrical Safe Work Practices for additional electrical safety requirements.

ARTICLE 4

TRIPPED CIRCUIT BREAKERS

1. If a circuit breaker trips or is found in a tripped condition, do not reset it. Contact Electrical Maintenance, Facilities Maintenance/Services or Water Resources Maintenance for assistance.

SECTION VII MECHANICAL SAFETY

ARTICLE 1

CUTTING AND WELDING PRACTICES

A. General

1. Welding and cutting shall be performed only by properly trained employees wearing approved personal protective equipment. Long sleeves shall be worn as part of the personal protective equipment when welding, cutting, brazing, heating, or grinding. Personnel involved in welding may use any welding equipment for which they have been properly trained and qualified. Welder trainees or welder helpers shall be under the direction of the welder and the leader.
2. Hot Work Authorization Permits are required for all welding, cutting, brazing, heating or grinding in areas that have been determined and designated as a fire precaution area.
3. The Industrial Hygienist shall be contacted, for safety guidance, if:
 - (a) Lead joints will be poured in any piping.
 - (b) Brazing will be done with cadmium containing brazing rod.
 - (c) If performing shielded metal arc welding (stick welding) on stainless steel.
4. Safety signs, shields, or barricades shall be placed around welding and cutting jobs where needed to protect employees and the public from welding arc or flame.

B. Welding Operations

1. Welding helmets and hand shields shall be used during all arc welding or arc cutting operations, excluding submerged arc welding. Goggles shall also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work, and from flying objects. The goggles may have either clear or colored glass, depending upon the amount of exposure to adjacent welding operations. Helpers or attendants shall be provided with proper eye protection.
2. Welding cables shall not be placed where they will block walkways or passageways. Welding cable shall not be allowed to lie in water or oil.
3. When not in use or workers are not in the vicinity, welding machine shall be turned off.

C. Eye Protection

1. While welding is taking place, personnel exposed to infrared or ultraviolet light are required to wear shaded lens appropriate for the welding operation.
2. All welding arc shall be protected from view of anyone passing by within 10 feet. Work will be positioned and protection applied to minimize exposure from 10 feet to 30 feet. Arc Protection when required shall be of a fireproof blanket, welding screen and/or other opaque material. Screens shall be used to prevent accidental exposure to employees.
3. Ordinary untreated plastic lenses do not adequately absorb ultraviolet light, and shall not be used to protect eyes from welding.

ARTICLE 2

GRINDING OPERATIONS

A. General

1. Do not use a bench or floor-stand grinder when any of the following conditions exist:
 - (a) Guard is not installed.
 - (b) Grinder not securely anchored.
 - (c) If the work rest exceeds 1/8" distance from the wheel.
 - (d) If the adjustable tongue exceeds 1/4" distance from the wheel.
 - (e) If excess wear is evident on the grinding wheel.
 - (f) If the wheel is chipped, cracked, out of round, or otherwise defective.
2. Grinding wheel shall not be operated in excess of the rated safe speed.
3. Do not side-grind unless both the grinder and the grinding wheel are designed specifically for this type of grinding
4. Check the grinding wheel mounting flanges for equal sizes and correct diameters. Flanges are to be at least 1/4 diameter of the wheel diameter.
5. Do not stand directly in front of any grinder when first starting it up.
6. Never force grinding stock into the wheel of a fixed grinder or force a portable grinder into the work to the point where the motor slows noticeably or the work becomes excessively hot.
7. Shatter resistant bulbs shall be used for stand/bench mounted shop grinders.

B. Cut Off Wheels

1. This tool is designed to perform a specific function and the manufacturer provides specific guidance on how to use the tool safely. The more delicate the tool, the more care and instruction it requires.
2. The standard cut-off wheel to be used on a grinder at Palo Verde is the 5/64 wheel.
3. When it becomes necessary to use a cut-off wheel smaller (thinner) than a 5/64 wheel, a job hazard analysis (JHA) shall be developed and implemented per Procedure 01DP-0IS14, Palo Verde Generating Station Job Hazard Analysis.
 - (a) The JHA shall include the manufacturer's instructions for safe use of the tool, be approved by the employee's leader and reviewed by the Industrial Health and Safety Department prior to use.

ARTICLE 3

METAL/WOOD WORKING PRACTICES

A. General

1. Machinery shall only be operated by authorized personnel.
2. Use a brush or other suitable means to remove chips, dust, or other material from machines.
3. Where the work must be held in position, it is securely bolted or clamped to the table or held in a vise or jig. Do not try to hold it by hand.
4. Ensure all guards are in place and properly adjusted before operating the machine.
5. Repairs and replacement of knives, blades, etc., shall only be performed by trained persons and only when the machine is powered off.
6. Do not use radial arm or swing saw if the blade will travel beyond the edge of the table.
7. Adjust anti-kickback fingers on both sides and the splitter before ripping materials on a radial or table saw.
8. Employees shall not work on or around mechanical operating equipment while wearing neckties, loose clothing, watches, rings, or other jewelry. Badge and lanyard shall be secured. Gloves shall also be removed. When operating lathes, drill presses or milling machines, short sleeve, or long sleeve shirts with sleeves rolled up and secured above the elbow with shirt tails tucked in shall be worn. If long sleeves are required to protect forearms while operating lathes, milling machines or drill presses, leader approval is required and the first 2-inches above the cuff shall be taped or secured using similar means. Gloves shall be worn while setting up or changing tools on the machine, but gloves shall not be worn while operating the machine.

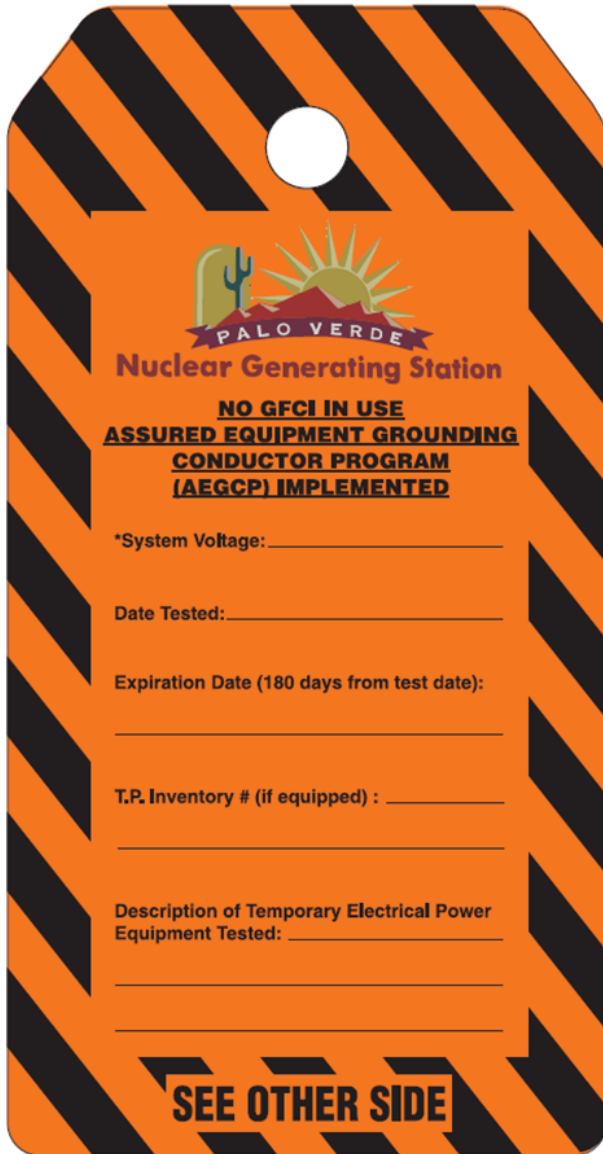
APPENDIX A

SAFETY MANUAL ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM (AEGCP) LOG

WO #	Work Discipline	Reason GFCI Protection Cannot Be Used and Description of Equipment Tested (Be Specific)	Approving Supervisor's Name	Date of Inspection	Test Performed By	AEGCP Tag Installed By	Expiration Date (Max. 180 Days)

APPENDIX B

(AEGCP Tag APN 00165647)




Nuclear Generating Station

NO GFCI IN USE
ASSURED EQUIPMENT GROUNDING
CONDUCTOR PROGRAM
(AEGCP) IMPLEMENTED

*System Voltage: _____

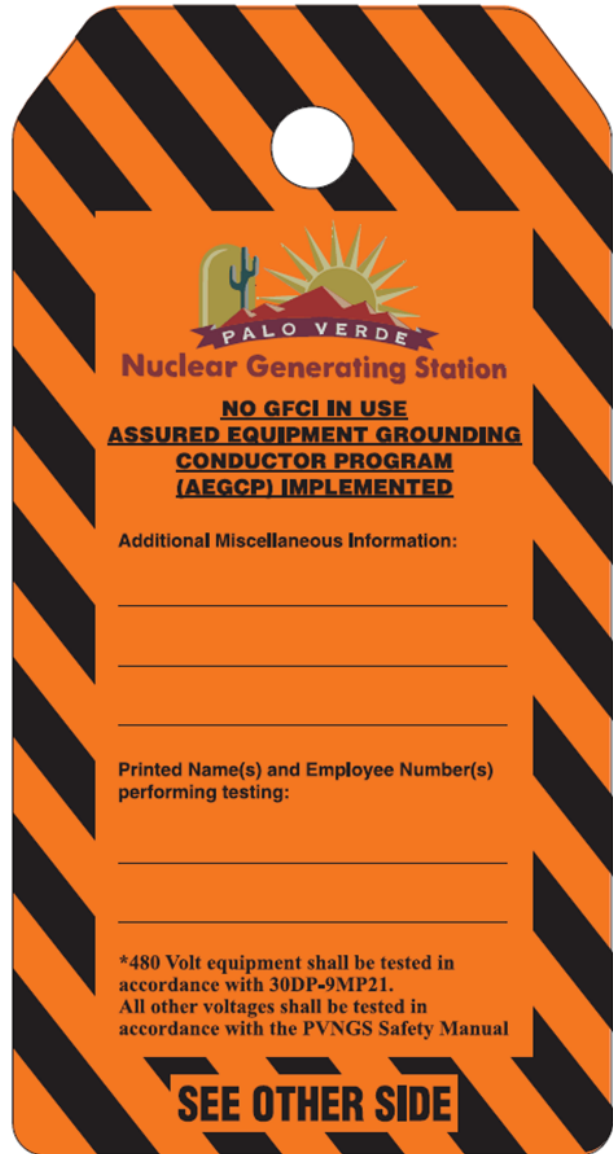
Date Tested: _____

Expiration Date (180 days from test date):

T.P. Inventory # (if equipped) : _____

Description of Temporary Electrical Power
Equipment Tested: _____

SEE OTHER SIDE




Nuclear Generating Station

NO GFCI IN USE
ASSURED EQUIPMENT GROUNDING
CONDUCTOR PROGRAM
(AEGCP) IMPLEMENTED

Additional Miscellaneous Information:

Printed Name(s) and Employee Number(s)
performing testing:

*480 Volt equipment shall be tested in
accordance with 30DP-9MP21.
All other voltages shall be tested in
accordance with the PVNGS Safety Manual

SEE OTHER SIDE

APPENDIX C

REFERENCE DOCUMENTS

For additional or detailed information, please utilize the listed procedures below.

01DP-0AP30, Management and Oversight of Supplemental Personnel
01DP-0EM10, Fitness For Duty Program
01DP-0IS08, PVGS Respiratory Protection Equipment Usage
01DP-0IS10, PVGS Respiratory Protection Program
01DP-0IS12, Confined Space Entry
01DP-0IS13, Palo Verde Generating Station Electrical Safe Work Practices
01DP-0IS14, Palo Verde Generating Station Job Hazard Analysis
01DP-0IS15, Control of Emergency Shower and Eyewash (ESEW) Equipment
01DP-0IS16, Handling of Asbestos Containing Material
01DP-0IS17, Heat Stress Prevention Program
01DP-0IS18, Area Inspections
01DP-0IS19, Personal Protective Equipment (PPE)
01DP-0IS20, Safety at Heights – Fall Protection
01DP-0IS21, Palo Verde Industrial Health and Safety
01DP-0FP01, Control of Flammable/Combustible Storage Cabinets
01DP-0TN01, PVGS Vehicle Management
02DP-0ZZ02, PVNGS Site Tagging Standard
12DP-0MC25, Stores
12DP-0MC45, Contract Management
14DP-0FP33, Control of Transient Combustibles
14DP-0FP36, Hot Work Permit
15DP-0TR69, Training and Qualification Administration
20DP-0SK45, SOCA Vehicle Access, Egress, and Parking Controls
30DP-0MP13, PVGS Rigging Control
30DP-0WM12, Housekeeping
30DP-9MP10, Mobile Crane Operation
30DP-9MP11, Field Use of Rigging
30DP-9MP12, Overhead Cranes
30DP-9MP13, Commercial Truck Mounted Cranes and Aerial Lifts
30DP-9MP17, Material Handling
30DP-9WP11, Scaffolding Instructions
30DP-9MP21, General Requirements for 480V Temporary Power Installations
37DP-9ZZ11, Excavation, Placement and Backfill
40DP-0OP08, Plant Labeling
40DP-9OP29, Power Block Clearance and Tagging
40DP-9OP34, Switchyard Administrative Control
40DP-9ZZ17, Control of Doors, Hatches and Floor Plugs
76RP-0RW10, Handling and Storage of Radioactively Contaminated Chemical Waste & Mixed Waste
91DP-0EN50, Waste Management
01DP-0AP61, Chemical Control Program
PV-POL-01, Excellence Model
WRSA-8ZZ02, WR Tagging and Clearance Procedure