

**P-01**

**Electrical and Machine**  
**Guarding**

## **I. Electrical Safeguarding Program**

### **A. Policy Statement**

DGS employees shall not be exposed to electrical hazards that may cause injuries or fatalities. Equipment shall be inspected to ensure all hazards are controlled; unsafe equipment shall be taken out of service. If maintenance must be done on electrical systems, electrical power servicing the equipment or systems shall be de-energized, and locked out/tagged out, if required by the lockout/tagout program.

All employees must be properly instructed concerning electrical hazards in their workplaces and understand the necessary safe work practices to avoid injury. Specific electrical hazards in each department shall be addressed with employees that have responsibilities to operate equipment.

### **B. Examination, Installation, and Use of Electrical Equipment**

All electrical equipment shall be installed and examined to ensure they are free from recognized hazards that are likely to cause death or serious physical harm to employees. Proper safety shall be determined by using the following considerations:

- Suitable installation of Underwriters Laboratory listed and labeled equipment and use per [OSHA standard 29 CFR 1910, Subpart S, Electrical](#) and the National Electrical Code, NFPA-20.
- Proper mechanical strength and durability, including parts enclosing and protecting equipment.
- Protection from heating effects under normal usage.
- Arc protection.
- Proper classification by type, size, voltage, current capacity, and specific use.
- Any other factors that should be considered to ensure employee safety.

### **C. Working Clearances**

Indoor areas containing electrical equipment; such as disconnects and electrical panels shall be maintained in a clean and orderly fashion, shall not be used as storage, and have adequate illumination. Objects shall not be placed within 36 inches of the front of an electrical panel.

## II. Machine Guarding

### A. Policy Statement

One or more methods of machine guarding or controls must be used to protect the operator and others in the machine area from hazards such as:

- Points of operation, such as saw blades, and metal shears;
- In-going nip points, such fan belts and chain drives;
- Rotating parts, such as fan blades, grinder wheels, motor shafts, power take-off shafts; and
- Flying chips and sparks, such as from grinding and welding operations.

Machine guarding requirements and procedures to be used as per OSHA 29 CFR 1910, [Subpart O, Machinery and Machine Guarding](#) and [Subpart P, Hand and Portable Powered Tools and Other Hand-Held Equipment](#); should be followed.

The supervisor or manager shall ensure all required guards are in place. Factory installed guards must not be removed or altered. Employees shall be informed to not operate equipment that is not guarded properly. Equipment that is not guarded properly must be taken out of service until guards are replaced. Two hand controls may be used for equipment that cannot be guarded effectively. The area supervisor is responsible to ensure all safety aspects of the machine guarding program are consistently implemented. If two hand controls are used to provide protection, the supervisor shall ensure the control systems operate properly before the machine is used.

### B. Maintenance Operations

If maintenance operations require guards to be removed for servicing of equipment, require other controls to be disabled, or the employee must place any part of their body in a hazardous area, the equipment must be de-energized before maintenance begins. If the equipment can be locked-out, locks and tags shall be installed according to the requirements of the [DGS Lockout/Tagout program](#). Equipment that cannot be locked out shall be tagged in the de-energized position. Exceptions include plug and cord type equipment where the maintenance person maintains control of the plug, and mobile equipment such as tractors and other power equipment. Mobile equipment shall be shut down during maintenance that requires guards to be removed.

### C. Inspections

Area supervisors shall inspect all equipment to ensure guards are installed as required before use. The attached checklist can be used for inspections if documented. Completed checklists can be returned to the manager, supervisor, or foreman for the equipment. Equipment that is not guarded properly must be taken out of service until the guards are replaced.

<b>Machine Guarding Inspection Checklist</b>			
<b>Machine/Equipment:</b> _____			
Date: _____ Location: _____ Completed By: _____			
<b>Mechanical Hazards</b>		<b>Yes</b>	<b>No</b>
<i>The point of operation:</i>			
1. Is there a point of operation guard provided?			
2. Does it keep the operator's hands, fingers, and body out of the hazard area?			
3. Is there evidence that the guards have been tampered with or removed?			
4. Could you suggest a more practical, effective guard?			
5. Could changes be made on the machine/equipment to eliminate the point of operational hazard entirely?			
<i>Power transmission apparatus:</i>			
1. Are there any unguarded gears, sprockets, pulleys, or flywheels on the apparatus?			
2. Are there any exposed belts or chain drives?			
3. Are there any exposed set screws, keyways, or collars?			
4. Are starting and stopping controls within easy reach of the operator?			
5. If there is more than one operator, are separate controls provided?			
<i>Other moving parts:</i>			
1. Are guards provided for all hazardous moving parts of the machine/equipment, including auxiliary parts?			
<b>Non-mechanical Hazards</b>			
1. Have appropriate measures been taken to guard employees against noise hazards?			
2. Have special guards, enclosures, or personal protective equipment been provided, where necessary, to protect employees from exposure to harmful substances used in machine operation?			
<b>Electrical Hazards</b>			
1. Is the machine/equipment installed in accordance with National Fire Protection Association and National Electrical Code requirements?			
2. Are there loose conduit fittings?			
3. Is the machine/equipment properly grounded?			
4. Is the power supply correctly fused and protected?			
5. Do employees occasionally receive minor shocks while operating any of the machines/equipment?			
<b>Training</b>			
1. Have applicable employees been trained in where the guards are located, how they provide protection, and what hazards they protect against?			
2. Have applicable employees been trained in how and under what circumstances guards can be removed?			

3. Have applicable employees been trained in the procedures to follow if they notice guards that are hazardous, missing, or inadequate?		
<b>Protective Equipment and Proper Clothing</b>		
1. Is protective equipment required?		
2. Are applicable employees dressed safely for the job (i.e. no loose fitting clothing or jewelry)?		
<b>Machinery/Equipment Maintenance and Repair</b>		
1. Have maintenance employees received up-to-date instruction on the machinery/equipment they service?		
2. Do maintenance employees lockout and tagout the machine/equipment from its power sources before beginning repairs?		
3. Where several maintenance employees work on the same machine/equipment, are multiple lockout devices utilized?		
4. Do maintenance employees use appropriate and safe equipment in their tasks?		
5. Is the maintenance machinery/equipment itself properly guarded?		
<b>Other Items to Check</b>		
1. Are emergency stop buttons, wires, or bars provided?		
2. Are the emergency stops clearly marked and painted red?		
3. Are there warning labels or markings to show hazardous areas?		
4. Are the warning labels or markings appropriately identified?		
<b>Requirements</b>		
1. Do the guards provided meet the minimum agency requirements?		
2. Do the guards prevent employees' hands, arms, and other body parts from contacting hazardous moving parts?		
3. Are the guards firmly secured and not easily removable?		
4. Do the guards ensure that no objects can fall into the moving parts?		
5. Do the guards permit safe, comfortable, and relatively easy operation of the machine/equipment?		
6. Can the machine/equipment be oiled without removing the guard?		
7. Is there a system for shutting down the machine/equipment before guards are removed?		
8. Can the existing guards be improved?		
<b>Other</b>		
1. Please enter any comments about your findings:		
_____		
_____		