Electricity travels in closed circuits, normally through a conductor. But sometimes a person's body, which is an efficient conductor of electricity, mistakenly becomes part of the electric circuit, thus causing electrical shock. When someone receives a shock, electricity passes through his/her body or through the body to a ground or the earth.

Effects of Shock on Human body: An electric shock can result in anything from a slight tingling sensation to immediate cardiac arrest. The severity depends on the following: the path of the current through the body, the amount of current flowing through the body, the duration of time the body remains in the circuit, and the frequency of current. In addition to shock and burn hazards, electricity causes dangers such as, arcs resulting from short circuits can cause injury or start a fire. High-energy arcs can destroy equipment, which causes fragmented metal to scatter in four directions. Low-energy arcs cause brutal explosions in atmospheres that contain inflammable gases, or dusts. Listed below are the 6 best practices to prevent electrical shocks and hazards in an organization.

1. Protection by Insulation
Insulators such as glass, rubber, mica, or plastic used to coat metals and other conductors help stop or reduce the flow of electrical current. This helps prevent shock, short circuits and fires. To be effective, the insulation must be suitable for the voltage used and conditions such as temperature and other environmental factors like moisture, gasoline, corrosive fumes, or any other substances that could make the insulator less efficient. The insulation that covers conductors in applications involving non-construction is regulated by Subpart S of 29 CFR 1910.302 through 1910.308, wiring design, protection.

2. Protection by Grounding
‘Grounding’ a tool or electrical system means intentionally creating a low-resistance path that connects to the earth. This prevents the build-up of voltages that could cause an electrical mishap. Grounding is a secondary protective step in protecting against electric shock. It does not provide any guarantee against electrical mishap; however, it will reduce the risk.

3. Circuit Protection Devices
Circuit protection devices limit or stop the flow of current automatically in the event of overload, or short circuit or a ground fault in the wiring system. Examples of these devices are circuit breakers, fuses, arc-fault circuit interrupters and ground-fault circuit interrupters. Fuses and circuit breakers open or break the circuit automatically when too much current flows through them.

4. Safe Work Practices

Electrical accidents are largely preventable through safe work practices. Best examples for such practices include the following: De-energizing electric equipment before inspection or repair, taking caution in maintenance of electric tools, being vigilant when working near energized lines, and using right equipment for protection. Electrical safety-related work practice requirements for general industry are detailed in Subpart S of 29 CFR Part 1910, in Sections 1910.331–1910.335. For applications in construction fields, electrical safety-related work practice requirements are detailed in Subpart K of 29 CFR Part 1926.416 to 1926.417.

5. Preventing Accidental/ Unexpected Equipment Start-up

Proper lockout/tag-out procedures protect you from the dangers of accidental or unexpected start-up of electrical equipment and are required for general industry by OSHA Standard 1910.333. Requirements under the applications of construction are in 29 CFR 1926.417, lockout, tagout of circuits. These procedures guarantee that electrical equipment is de-energized before it is repaired or inspected and protects you against electrocution or shock. The first step before beginning any inspection or repair job is to turn the current off at the switch box and padlock the switch in the OFF position. Only qualified electricians who have been trained in safe lockout procedures should maintain electrical equipment.

6. Follow the Lockout/Tagout Standards

The lockout/tagout standard establishes the employer’s responsibility to protect employees from hazardous energy sources on machines and equipment during service & maintenance, develop, document, implement, and enforce energy control procedures. Use only lockout/tagout devices authorized for the particular equipment or machinery and ensure that they are durable, standardized, and substantial. Ensure that lockout/tagout devices identify the individual user. Provide effective training as mandated for all employees covered by the standard. Comply with the additional energy control provisions in OSHA standards when machines or equipment must be tested or repositioned, when outside contractors work during personnel changes or shifts, in group lockout situations. The standard gives each employer the flexibility to develop an energy control program suited to the needs of the particular workplace and the types of machines and equipment being maintained or serviced. This is generally done by affixing the appropriate lockout or tagout devices to energy-isolating devices and by de-energizing equipment and machines. The standard describes the steps required to do this.

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