

# Motor Control Centers

## I PURPOSE

To establish minimum safe operating procedures in electrical sub-stations and motor control centers.

## 2 SCOPE

This procedure applies to all functional areas, operations, offices, including employees, vendors, visitors and contractors within the scope of the Integrated Management System (IMS).

## 3 DEFINITIONS AND ACRONYMS

### Definitions

**Authorized Personnel** is a qualified worker assigned to the execution of a task or who is allowed to enter certain restricted access areas as authorized by the electrical department.

**Breaker** is a device for protecting, closing, and/or opening an electrical circuit.

**Electrical Circuit** is a system that conducts and delivers electrical energy.

**Energizing** is to supply electricity to a circuit by turning on a breaker, disconnect, or other switching device.

**General Rules** are rules which apply to all employees, vendors, visitors, and contractors regardless of where they work or what they do.

**High Voltage** is greater than 5,000 Volts

**Job Specific** is any requirement directly associated with a specific job, task, or occupation.

**Low Voltage** is less than or equal to 600 Volts.

**Medium Voltage** is greater than 600 Volts and less than 5,000 Volts.

**Motor Control Center/Electrical Control Room** is an area where electrical devices such as breakers, starters, fused disconnects, and other types of switch gear are used to control motors.

**Qualified Worker** is one who has skills and knowledge related to construction and operation of the electrical equipment and installations and has received safety training on the hazards involved. They shall be authorized and may be contractor or COMPANY personnel.

**Site** refers to any COMPANY facility.

**Substation** is an area or yard which is mainly high voltage which is usually fenced and has transformers and disconnecting devices for distribution to other electrical circuits.

**Switch** is a device for closing or opening an electrical circuit.

#### **Acronyms**

<b>ANSI</b>	American National Standards Institute
<b>ASTM</b>	American Society for Testing and Materials
<b>HMR</b>	HSLP Management Representative
<b>HSLP</b>	Health, Safety and Loss Prevention
<b>IMS</b>	Integrated Management System
<b>NEC</b>	National Electrical Code
<b>MCC</b>	Motor Control Center
<b>PPE</b>	Personal Protective Equipment

## **4 ROLES AND RESPONSIBILITIES**

### **Document Owner**

HMR

### **Responsible Roles and Position-Holders**

**Contractors/Vendors** are businesses performing a service for the COMPANY. They are responsible for ensuring their employees working on COMPANY sites have the required training as specified in this procedure and that their employees understand and comply with the requirements as outlined in this procedure.

**Employee and Contracted Employees** are all employees in any position whether COMPANY or contracted employees working on any COMPANY site. They are responsible for complying with the requirements as outlined in this procedure.

**Visitors** are anyone not employed by the COMPANY in any capacity but are traveling or touring on a COMPANY site. They are responsible for complying with the requirements as outlined in this procedure.

**HSLP** is any COMPANY employee working under and including the Regional Director of HSLP. They are responsible for establishing the minimum requirements for electrical substations and motor control centers and periodically auditing for compliance to this procedure.

**A Supervisor/Foreman or Designee** can be a COMPANY employee or a contractor/vendor working or traveling on any COMPANY site. They are responsible for enforcement of all requirements, rules, and established guidelines as outlined in this procedure. They ensure personnel are provided with needed tools/equipment and the necessary proper instructions/training.

## 5 DIRECTION

All employees, vendors, contractors, and visitors traveling/working on site shall comply with and ensure personnel accountable to them comply with the following requirements of this procedure.

### General Rules

Personnel shall be provided with electrical protective equipment suitable for work hazards.

Gates of sub-stations shall always be closed and locked. They shall also display signs indicating the access restrictions.

Access to electrical connections, fuse boxes, switches, transformers and other electrical equipment shall be marked with proper voltage signs.

All electrical boxes, conductors, wires, etc. shall be designed and manufactured in compliance with UL listing.

Main power switches shall be labeled, indicating the units they control.

All areas shall be kept clean and neat. All electrical boxes, covers, protectors and comparable items shall always be closed, except for maintenance, testing or repairs.

Electrical installation areas, MCC rooms and substations shall not be used as storage areas, lunchrooms, workshops, break rooms or similar areas.

No flammable materials shall be stored in electrical control rooms for any reason, either temporarily or permanently.

No combustible materials shall be stored nor shall they be allowed to accumulate within 25 feet of electric substations.

- a** No dry vegetation shall be allowed within the 25 foot perimeter.

Whenever there is any possibility of an electrical shock at an electrical control panel or switch panels, mats or platforms, made of insulating material or any other non-electrically-conducting material, shall be adequately placed.

There shall be adequate lighting in all electrical control rooms / MCCs.

There shall be emergency lighting in electrical control rooms / MCCs.

All MCCs and sub-stations shall have at the least a fire detection system and firefighting equipment.

There shall be at least two 20-pound CO<sub>2</sub> or equivalent fire extinguishers at each MCC.

In the case of new Projects or modifications, the Project Electrical Supervisor shall be responsible for the work, with approval and knowledge of the Area Electrical Supervisor.

An annual program of maintenance, inspection and testing of grounded systems on electrical equipment shall be developed and maintained.

The electricians shall be trained in first-aid including cardiopulmonary resuscitation (CPR).

Extension cords, electrical tools and equipment shall have ground testing conducted per NEC requirements and colors as outlined for years ending in number as outlined below:

- (a) 0 = Black
- (b) 1 = Brown
- (c) 2 = Red
- (d) 3 = Orange
- (e) 4 = Yellow
- (f) 5 = Green
- (g) 6 = Blue
- (h) 7 = Violet
- (i) 8 = Grey
- (j) 9 = White

Color	Band	Color	Band
Black	0	Green	5
Brown	1	Blue	6
Red	2	Violet	7
Orange	3	Grey	8
Yellow	4	White	9

Every temporary electrical installation shall be grounded.

Wires shall not be installed in corridors and workplaces in a manner where damage may occur.

Underground power lines shall be visibly marked with signs or other approved marking methods to indicate the hazard.

### **Entry to MCC**

Lock-out/Tag-out requirements shall be complied with if electrical work is to be done in the MCC area.

Communicate with all parties involved prior to the start of work and complete the task or job assignment per the site policies.

Remove the Lock-out/Tag-out devices following the Lock-Out/Tag-Out requirements.

### **Entry into a Sub-Station**

To work with no voltage, the following shall be completed:

- a** Open the switch/selector of the pertinent system to isolate it from the main power source.
- b** Lock out the selector's operational elements in an open position and identify and place the tag-out.
- c** Make sure there is no voltage in the isolated system and other related components.
- d** Ground and short-circuit the electrical system, not removing it until the work is completed.
- e** Mark the work area and protect nearby parts remaining powered.

If the task is not completed and until the work is resumed at another time when this procedure shall be repeated:

- a** The isolation and the Lock-out/Tag-out or grounding shall not be removed.
- b** “Danger, Do Not Operate” tags shall be placed by the Operations Supervisor or qualified personnel.

Entry into sub-stations is only allowed by authorized personnel for the sub-station being entered.

Nobody shall work, enter or be assigned to work in a sub-station by themselves.

HSLP personnel are authorized to enter substations for inspection purposes.

- a** They shall only do so upon notification of the person responsible for the sub station and then they shall be accompanied by electrical personnel authorized to be within the substation.
- b** These inspections are visual only and no handling of equipment shall take place while within the substation