# Equipment Installation

## Course 319: Equipment Installation

Covers installation procedures for large plant equipment. Considers factors affecting proper installation in detail, from preparatory relocation of underground piping and wiring, through equipment anchoring, aligning, and test running.

TPC Training is accredited by IACET to offer **0.5 CEU** for this program.

### Lesson 1: Preparing the Site

*Topics*

The Engineer Plans the Installation; The Maintenance Supervisor's Responsibilities; Relocating Underground Piping; Relocating Underground Wiring and Cables; Protecting Nearby Buildings and Equipment; Barricading the Work Area; Removing Excavated Material; Foundation and Footings; Reinforced Concrete; Materials for Reinforcing Concrete; Using Wooden Forms; The Right Concrete Mixture; Materials for Fill around Foundation; Positioning Anchor Bolts with a Template; Installing Alignment Plates; Surface Finish of Concrete; Setting or Curing Time for Concrete; Finishing Flooring around Foundation; Outdoor Foundations; Safety Precautions for Excavation Work

*Objectives*

- Tell who plans the installation of new equipment and list the steps involved.
- Define the terms foundation and footing.
- Tell which type of ground will support the most weight.
- Explain how steel rods are held in position when pouring a concrete footing.
- Name the best materials for filling around a foundation.
- Explain how to protect concrete that might come into contact with oil or chemicals.
- Tell how long new concrete must sit before equipment is installed on it.

### Lesson 2: Vibration Control and Anchoring

*Topics*

Reasons for Controlling Vibration; How to Control Vibration; Selecting Anchors and Isolators; Isolating the Foundation; Isolator Mounts; Using Anchor Bolts; Types of Anchor Bolts; Drilling Anchor Bolt Holes; Using Power Hammers; Grouting

*Objectives*

- Define vibration and tell how it enters and leaves equipment.
- Tell what type of isolation is best to use on sensitive testing instruments.
- Explain how to isolate anchor bolts when mounting equipment on pads.
- Tell what type of wrench to use for tightening anchor bolts.
- Name the best tool for drilling anchor bolt holes in concrete.
- Tell why the bases of production and processing equipment should be grouted.
- Explain why you must not use a concrete mix to grout anchor bolts.

### Lesson 3: Moving and Setting

*Topics*

Uncrating New Equipment; Relocating Existing Equipment; Know the Weight of the Load; Machinery for Lifting Equipment; Raising Equipment with Jacks; Lifting Plant Equipment with Slings; Hand Tools for Moving Equipment; Crowbars; Preparing to Move the Equipment; Making the Move; Setting the Equipment in Position; Personal Safety during Installation

*Objectives*

- Explain the procedures involved in relocating existing equipment.
- Tell two things you must know before lifting equipment with a hoist.
- List three things to consider when selecting a jack.
- Explain the operation and uses of a roller skid.
- Tell where to find a floor's allowable load.

### Lesson 4: Leveling and Aligning

*Topics*

Leveling Devices; Checking the Accuracy of Levels; Using Spirit and Electronic Levels; Using the Optical Level; Leveling Feet and Bolts; Wedges and Shims; Tools for Checking Alignment; Aligning Equipment on the Foundation; Using Alignment Screws; Aligning Machine Tool Equipment; Other Plant Equipment

*Objectives*

- Explain the correct way to handle a master precision level.
- Explain how to check the accuracy of a level.
- Name the greatest enemy of precision tools.
- Explain how to level V-shaped ways.
- Tell which leveling device is used most often on small equipment.
- Name three tools commonly used to check alignment.
- Tell how to set an alignment screw to prevent its movement.

### Lesson 5: Checking and Test Running

*Topics*

Electric Power Connections; Hydraulic and Pneumatic Power Connections; Coolant Systems for Equipment; Equipment Safety Devices; Settings and Adjustments; Equipment Operating Pressure; Limit Switches and Stops; Checking the Equipment Setup; Initial Running under Power; Test Run Guidelines; Making the Test Run; Safety Precautions for Installing Equipment

*Objectives*

- Explain how to test for the presence of moisture in electrical equipment.
- Tell what device is commonly used to prevent excessive pressure in a hot water heater.
- Explain the function of a pressure regulating valve.
- List the steps to take before initial equipment startup.
- Tell the usual cause of excessive temperature during equipment startup.