



## **NOISE MM – Noise Measurement and Mitigation**

**Length:** 4.5 Days

### **Overview**

NOISE-MM covers comprehensive methods used to measure, analyze and mitigate the effects of noise interference on telecommunications services, emphasizing the principles of noise investigation, mitigation and power system elements that contribute to harmonic interference. Hands-on lab exercises covering measurement techniques utilize state-of-the-art equipment to reinforce key points made in the classroom.

Upon course completion, you will be tested to reinforce your knowledge and determine areas for further study. Successful completion of this test will earn TPI Trainers Certification.

**Customization:** NOISE-MM reflects current industry standards and can be customized and presented at your location to meet the unique needs of specific work groups, such as installation technicians and managers, facility maintenance technicians, network maintenance technicians and technical support engineers. Call 1-630-607-9302 for information on customized versions of this course.

### **You Will Learn**

- How to identify defective cable pair and cable shielding and how to locate and repair the defects.
- How to determine excessive power line influence and locate and modify power system components to reduce the influence level.
- How to work cooperatively with power companies for joint testing and power line modifications.
- Special telephone circuit modifications designed to reduce noise.

### **Course Outline**

- AC Power Distribution Systems
  - Single- and Three-phase Operations
  - 60 Hertz and Harmonic Frequencies
  - Transformers and Rectifier Effects
  - Capacitor Bank Resonance
- Power System Energy Transfer into Telephone Circuits
  - Magnetic Coupling Mechanism
  - Mutual Impedance Calculations
  - Telephone Cable Shielding

- Power Line Influence Measurements
  - Exploring Coil and Probe Wire
- Ground Measurements
  - Test Equipment
  - Electrode Resistance
  - Earth Resistivity
- Noise Measurement Equipment
  - C-Measure Weighting
  - Circuit Noise
  - Power Influence
  - Individual Frequencies
  - Reference Noise Scale
- Circuit Noise Investigation
  - Power Influence Levels
  - Predominant Frequencies
  - Circuit Balance
- Cable Pair Performance
  - Requirements
  - Shunt and Series Faults
- Cable Shielding
  - Design Levels
  - Trouble Causes
  - Determination of Effectiveness
  - Location of Defects
- Noise Case Studies
  - Logical Investigation Procedure
  - Joint Testing with the Power Company
  - Power System Coordination and Modifications
  - Mitigation Devices and Applications
- Radio Frequency Interference
  - Typical Sources
  - RF Signal Suppression
  - Demodulation Criteria and Prevention
  - FCC Bulletin
  - Customer Responsibilities



### **Hands-On Exercises and Activities**

You will examine case histories from actual inductive interference problems and learn to plan an effective inductive interference investigation using a wide variety of test sets and mitigation equipment.

- Probe Wire Lab: Measure power line influence levels and frequencies using three different frequency analyzers.
- Loop Noise Trouble Isolation Lab: Practice finding the location of cable pair defects that contribute to subscriber noise problems.
- Ground Measurement Lab: Measure earth resistivity and electrode resistance using four different earth testers.

### **Take Home Materials:**

You will receive a comprehensive course manual with ample space for notes and answers to specific questions. The manual becomes your personal reference back on the job. You will also receive a computer diskette containing several useful noise-related programs.

### **Who Can Benefit:**

Telephone industry and power industry technicians, engineers and managers involved with subscriber noise troubles on telephone services caused by power line and radio frequency interference.

An understanding of basic electrical concepts is recommended.

