

## Course Description

This Hands-On 1-Day course addresses telecommunications Central Office construction, routine maintenance and trouble isolation related to bonding & grounding and noise mitigation.

The Outside Plant Bonding & Grounding training course is a pre-requisite for this course.

This course is intended to provide the student with an understanding of electrical sources that could injure people or damage equipment. Proper Central Office bonding & grounding of Central Office equipment for the protection of people from injury and equipment from damage due to foreign voltage and current originating from lightning and commercial AC power outside the Central Office. Covering procedures to minimize the effects and the proper test procedures to determine the integrity of the Central Office grounding system.

References for this training course are the National Electrical Code (NEC) and Rural Utility Service (RUS) documents.

## Students Will Learn

- Explain the causes and effects of lightning and commercial AC power on the Central Office.
- Explain proper Central Office bonding & grounding techniques.
- Effectively test the Central Office ground system and ground grid for proper installation and operation.
- And much more

## Target Audience

Vendors and telecommunications personnel (engineers, planners, supervisors and technicians) responsible for ensuring that proper grounding requirements have been employed for buildings, power, switches and transport systems. Personnel responsible for maintaining and accepting new or rearranged equipment from an Central Office perspective.

## Prerequisites

An understanding of basic electrical concepts, telecommunications equipment terminologies and OSP Bonding & Grounding is required. This knowledge can be obtained in these courses

- Basic Electricity
- TeleCom I
- OSP Bonding & Grounding

## Course Outline

### Module 1 – Review of Outside Plant Bonding & Grounding Principles and Practices

This lesson covers a general review of bonding & grounding principles, practices and requirements that were studied in the Outside Plant Bonding & Grounding training class.

Objective: After this lesson the student will understand the bonding & grounding principles, practices and requirements related to the Outside Plant facilities, protection of Customer Premises, and NEC and RUS requirements.

### Module 2 –Central Office Bonding & Ground System

This lesson covers bonding and grounding of the Central Office building and equipment, which is complicated by the use of sensitive electronic equipment and the variation of equipment types typically found in the Central Office. Requirements listed in NEC and RUS documents are applied to the Central Office grounding system, including: Ground bars; cable size, length and routing; frame and equipment grounding; and Outside Plant cable shield grounding.

Objective: After completing this lesson, the student will be able to describe the concept, theory and practical application of the Central Office grounding system and how it will protect people and equipment located inside the Central Office building.

### Module 3 – Hands-On Audit of the Central Office Grounding System

This lesson is a complete hands-on Audit of a Central Office grounding system in accordance with the NEC, RUS documents and company practices. The Audit covers the proper application of ground bars, ground system cables and connections, equipment frame grounds, Outside Plant cable shield testing and ground field testing.

Objective: After completing this lesson, the student will be able to effectively perform a complete Central Office ground system Audit, list any discrepancies found, and make recommendations for changes required to meet NEC, RUS and company requirements.

#### References:

“NFPA 70, National Electrical Code (NEC), 2002 Edition,” National Fire Protection Association; Batterymarch Park, Quincy, MA; 1996.

“Electrical Protection Fundamentals,” RUS bulletin 1751F-801; Rural Utilities Services, United States Department of Agriculture, Washington D.C.; 1995.

“Electrical Protection Grounding Fundamentals,” RUS bulletin 1751F-802; Rural Utilities Services, United States Department of Agriculture, Washington D.C.; 1994.

“Electrical Protection at Customer Locations,” RUS bulletin 1751F-805; Rural Utilities Services, United States Department of Agriculture, Washington D.C.; 1995.

“Electrical Protection of Outside Plant,” RUS bulletin 1751F-815; Rural Utilities Services, United States Department of Agriculture, Washington D.C.; 1995.

“Acceptance Check List – Single Point Grounding System,” RUS bulletin 1753E-001; Rural Utilities Services, United States Department of Agriculture, Washington D.C.; 1995.

“Electrical Protection of Digital and Lightwave Telecommunications Equipment,” RUS bulletin 17 51F-810; Rural Utilities Services, United States Department of Agriculture, Washington D.C.; 1995.

## Delivery Method

Instructor led with numerous Hands-On labs and exercises.

## Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

## Course Length

1 Day