Hands-On

Fiber Optics ISP/OSP - Advanced Combo-Tech



Course Description

This Hands-On 3-day course has been customized to provide technicians with a practical understanding of fiber optic theory and fiber applications in (ISP)Local Area Network, Security and Closed Circuit TV systems and more in-depth Hands-On focus on a wider array of (OSP) Fiber Optic systems and components, installation, splicing, testing and maintenance techniques and including additional Advanced Testing and Troubleshooting modules....

A Fiber Optic Installer has a general understanding of optical fiber installation, connectorization, splicing, and testing, is familiar with optical fiber, connector, and splice performance characteristics described in TIA/EIA-568B, ITU-T G.671, ITU-T G.652 and Telcordia GR-326 A Fiber Optic Installer can perform connector endface evaluation as described in TIA/EIA-455-57B, is proficient in optical loss testing as described in TIA/EIA-526-14A, and understands the installation requirements described in articles 770 and 250 of the National Electrical Code. A Fiber Optic Installer is proficient at the installation of connectors on various types fiber of optic cables using various types of epoxies, and can perform mechanical and fusion splicing and more...

Students Will Learn

- The History Of Fiber Optics & Evolution Of Fiber Systems.
- Fiber Manufacturing Methods.
- Fiber Optic Theory And Waveguide Functions.
- Singlemode (OSP) And Multimode (ISP) Fiber Types.
- The Causes Of Attenuation, Optical Reflection And Refraction.
- Optical Dispersion Characteristics And Pulse Spreading Issues.
- Loose Tube And Unitube Style Trunk Cables
- Distribution And Feeder Cables.
- Fusion Splicer Applications And Fiber Alignment Systems
- Mechanical Splicing Uses And Applications
- Optical Connector Styles And Applications
- Back Reflection Issues And Angled Physical Contact Connectors
- Patch Panels And Functions For Distribution And Transmission
- ISP/OSP Style Splice Closure Styles And Function
- Cable Entry Methods And Splitter Configurations
- Drop Cable Connectivity And Security
- Cable Installation Methods As Direct Bury, Aerial And Ducted
- Emergency Restoration Issues, Future Planning, Restoration Kits
- Safety Practices

- Topologies For Urban And Rural Communities
- Splitters, ONTs/OLTs/ODNs
- Intro To Optical Testing And Troubleshooting.
- Visible Light Sources, OTDRs And Power Meters
- Testing Methods For ISP/OSP Systems
- Advanced Testing & Troubleshooting Modules
- And More...

Target Audience

Inside Plant/Outside Plant technicians, contractors, union craftsman, electricians, technicians, installers, splicers, engineers, facilities managers, telecom managers and anyone involved in repairing, installing, maintaining, designing, evaluating, or provisioning Fiber Optic Cables and Optical Networks.

Prerequisites

A basic understanding of telecommunications.

This information can be obtained in our courses below or equivalent knowledge TeleCom Networks Today "II"

Basic Telephony & Telecom Electronics

Course Outline

MODULE I FIBER OPTIC GENERAL STUDIES INTRODUCTION Common Industry Terminology History of Fiber Optics Advantages/Disadvantages of Fiber Optics Basics of a Fiber Optic Communications System Fiber Types and Manufacturing Processes (VIDEO) Typical Transmission Rates for Voice, Video & Data Applications System Topologies Fiber Optic Standards And More... THEORY TOPICS Theory of Light Electromagnetic Spectrum Total Internal Reflection (Singlemode) Refraction (Multimode) Index of Refraction (Refractive Index)

Light Sources (LEDs & LASERs)

Power (dbm/watts)

Core/Cladding/Coatings

Numerical Aperture

Macro/Microbends

Wave Division Multiplexing (WDM, CWDM, DWDM, etc.)

Optical Switching Fundamentals

And More...

FIBER TOPICS

Optical Fiber Types

Typical Fiber Specifications

Multimode Optical Fibers

Singlemode Optical Fibers

Dispersion Characteristics

Modal Dispersion

Chromatic Dispersion

And More...

FIBER CABLE TYPES

Outside Plant

Inside Plant

Loose tube Gel Filled (OSP)

Tight Buffered Distribution (ISP)

Tight Buffered Breakout (ISP)

Jumper Cables and Hybrids styles

Reverse Oscillation Locator (OSP)

Fiber Color Code

And More...

MODULE II FIBER OPTIC SAFETY ISSUES

SAFETY FIRST

LASER Safety and Warning labels

Types of LASERs

LASER Output Power Levels

Eye Safety Precautions

Safe Glass Disposal Practices

Food and Drinks Not Safe

Proper Person Cleanliness

Safe Work Surroundings

Confined Spaces Issue

TOOLS:

Cable Jacket

Fiber Coating Strippers

Mid-Entry Tools

Ring Tools

Tube Splitters

Knives

Slitters

Scissors/Snips

Safety Tweezers

And More...

MODULE III FIBER OPTIC CABLE INSTALLATION

PROPER PLANNING

Project Considerations

Cable Pre-testing

Cable Reels Identification and Handling

Proper Cable Pulling Techniques

Outdoor Cable Design Characteristics

Direct Bury Cable Installation

Directional Boring Methods

Buried Cable Depths

Man Holes and Vaults

Cable Pulling Specifications

Tensile Strength and Bend Radius

Avoiding Installation Obstacles

Grounding and Bonding Fiber Cables

Identifying Cable Types

Work Area Protection Issues

And More...

MODULE IV FIBER OPTIC CONNECTORS

Connector Types

Different types

Use of connectors

ST Style Connector Assembly; Hand and/or Machine Polishing and Inspection

SC Style Connector Assembly; Hand and/or Machine Polishing and Inspection $\,$

Also Types: FC, LC, MIL-C Series, Biconic, etc.

FIBER OPTIC ENCLOSURES

Applications

Patch Panels

Distribution of Fiber

LAN

Media outlets

Fiber Management Bays

INSTALLING CONNECTORS

Connector tools

Each attendee will install connectors

TESTING CONNECTORS AND JUMPER LOSS

Measure loss of previously installed connectors

Test loss of jumpers

Fiber Testing Parameters

Continuity Testing

MODULE V FIBER OPTIC SPLICING SPLICING

M echanical and Fusion Splicing

F usion Splicer Types and Operations

Precision Cleaver Operation

Set-up Fusion Splicer and Cleaver Work Stations

Practice Fiber Stripping, Cleaning and Cleaving Practice In-Line Fusion Splicing Practice Pigtail Fusion Splicing Qualify Acceptable Splices a nd More...

MODULE VI FIBER OPTIC TESTING

TESTING INFORMATION The dB Scale and Units of Loss OTDR Functions for Testing OTDR Testing for Splices, Distances and Back Reflection **OTDR** Trace Guidelines The Dead Zone Trace Events and Interpretation Testing at Various Wavelengths System Loss Parameters Calculating System Loss Total System OTDR Testing Optical Loss Test Sets (OLTS) Referencing the Test Set First Measuring Cable System Loss **Documenting Test results** And more...

Module: VII Advanced Test Accepting and Troubleshooting Fiber Systems

Understanding attenuation Causes of attenuation Testing attenuation at different wavelengths Understanding back reflection Understanding return loss APC (Angled Physical contact) connector verses UPC connectors back reflection Optical dispersion characteristics and pulse spreading issues Power testing levels for FTTH And more...

Module: VIII Advanced Testing & Meters Used in Fiber Systems

OTDR use
Setup of the OTDR
Identifying OTDR traces
2 point and 4 point OTDR test
Testing at different wavelengths
Measure fiber length, loss and back reflection
Measure to events and how to add landmark events
Setup of the Power meter and light source
Interpreting PM and Light source results
Using the visible light sources
And more

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

3 Days