

Hands-On

5ESS Trunk Testing Provisioning and Maintenance



Course Description

This Hands-On course, Trunk Testing Provisioning and Maintenance, begins with an overview of the 5ESS Switch and the telecommunications Trunking Network.

This overview includes 5ESS Switch Modules, Unit functions and Trunking concepts. Next, the course identifies the Transport Facilities that Terminate in a 5ESS Switch, including Line Coding, Framing and Data Rates. The System Signaling 7 (SS7), Out-Of-Band signaling is presented next and includes SS7 structure, Point Codes, Operation, Output Messages, Testing and Protocol.

The 5ESS Trunk Provisioning presents Recent Change Views (RCV) RCV 5.1, RCV 5.3, RCV 5.5, RCV 10.2, RCV 20.4, RCV 20.24 and RCV 20.31. The Trunk Testing consists of both Automatic and Manual Trunk Testing procedures along with Trunk Testing concepts and result analysis. The tests presented consist of Transmission, Signaling (In-Band and Out-Of-Band), Supervision, Data Rate, Digit Pulsing, Talk and Monitor functions and Manual On Hook and Off Hook tests.

This includes Trunk Line Work Station (TLWS) poke commands and 5ESS Input Messages. The course also presents procedures on Turning Trunks Up For Service including the tests that should be performed and the 5ESS Status printouts that should be requested.

The last lesson covers 5ESS Trunk Maintenance which includes Trunk failure messages such as Machine Detected Interoffice Irregularities (MDII) and System Signaling 7 (SS7) messages. This course includes procedures, tables, charts, and information on the resolution of Trunk Service issues, with recommendations of What To Do Next. 5ESS documentation is used and referenced throughout this course.

The objective of Trunk Testing Provisioning and Maintenance is to train provisioning and maintenance personnel to build / translate, turn-up and maintain Trunk circuits in a 5ESS Switch.

Students Will Learn

- **State what a Trunk is**
- **Identify the 5ESS Switch Units that support Trunks**
- **List the Transport facilities terminating in a 5ESS Switch**
- **Identify 5ESS Switch Recent Change Views and Fields needed to provision Trunks**
- **Perform Transmission, Signaling, Supervision and Data Rate tests**
- **Establish a talk connection over the Trunk Line Work Station, Talk and Monitor**
- **Monitor Out Pulsed Digits**
- **Identify the tests performed and printouts obtained when Turning a Trunk Up For Service**
- **Analyze Machine Detected Interoffice Irregularities (MDII) failure messages**
- **And More...**

Prerequisites

This course builds on the knowledge gained from basic and introductory 5ESS Switch courses. Basic knowledge of the 5ESS Modules and Units, such as
 Administrative Module (AM)
 Communications Module (CM)
 Switching Module Processor (SMP) Module Controller and Time Slot Interchanger (MCTSI)
 Switching Module Peripheral Units, such as Line Unit, Access Interface Unit, Digital Line Trunk Unit, Digital Network Unit, Digital Service Unit, etc.

Ability to use 5ESS Switch support documentation, such as
 5ESS Switch Dyna Text documentation
 5ESS Switch Input Messages Manual
 5ESS Switch Output Messages Manual

Course Outline

Lesson 1 Overview of the Trunking Network

This lesson, Overview of the Trunking Network, presents 5ESS Switch and the telecommunications Trunking Network. The lesson provides a basic overview of the 5ESS Switch Modules, Peripheral Unit and Peripheral Unit call processing functions. Next, this lesson presents an overview of telecommunications Trunking concepts, such as: trunk connections, transport facilities, signaling, trunk classes, trunk types, and others. This lesson establishes the basic knowledge needed for the following lessons. This lesson includes references to Alcatel-Lucent Dyna Text 5ESS Switch support documentation.

Lesson 2 Transport Facilities in a 5ESS Switch

The Transport Facilities in a 5ESS Switch lesson presents the Analog and Digital Transport Facilities available and the peripheral units they terminate on in a 5ESS Switch. The lesson begins by defining transport facilities within the telecommunications industry. This is followed by identifying how these transport facilities terminate in the 5ESS Switch. In order to understand Digital Facilities, the students need a short analog/digital conversion presentation which is presented next. This leads into Line Coding, Framing, Data Rate and Signaling along with where these items are optioned in the 5ESS

Switch. The lesson completes by presenting 5ESS Performance Monitoring and 5ESS Switch Transport Facility fault analyzation procedures. The lesson includes references to Alcatel-Lucent's Dyna Text 5ESS Switch support documentation and relates procedures in the lesson to this documentation.

Lesson 3 System Signaling 7

This lesson presents System Signaling 7 (SS7) and its features. The lesson begins with an overview of common trunk signaling methods currently in use. This is followed by presenting the SS7 operational platform structure and linkage configurations. Next the lesson presents 5ESS Switch trunk related SS7 Input and Output messages. These Input and Output messages are essential for verifying and testing the provisioning of SS7 trunks in a 5ESS Switch. The SS7 Service Control Point (SCP) is presented along with INWATS and Local Number Portability (LNP) query procedures. The last part of this lesson presents 5ESS SS7 Protocol Monitoring. The advantage students gain from the material presented in this lesson is the ability to use 5ESS SS7 Input and Output messages during circuit provisioning and maintenance. The lesson references to Alcatel-Lucent's Dyna Text 5ESS Switch support documentation and relates procedures in the lesson to this documentation.

Lesson 4 Provisioning Trunks in a 5ESS Switch

This lesson, Provisioning Trunks in a 5ESS Switch, presents the 5ESS Recent Change Views used to establish Trunk Services. This lesson addresses the fields and their functions on the following Recent Change Views (RCV): RCV 5.1, RCV 5.3, RCV 5.5, RCV 10.2, RCV 20.4, RCV 20.24 and RCV 20.31. The lesson also provides Trunk Class (RCV 5.1) descriptions and how these trunk types are translated. This lesson also presents a Line to Trunk and a Trunk to Line call flow based on Recent Change Views. The lesson includes references to Alcatel-Lucent's Dyna Text 5ESS Switch support documentation and relates procedures in the lesson to the documentation.

Lesson 5 Testing Trunks

This lesson presents Trunk Testing procedures, concepts and result analysis. This lesson presents Trunk maintenance procedures with the emphasis placed on the actual testing of trunks. These tests consist of Transmission (Levels Loss, Noise, Noise With Tone and Gain Slope), Signaling (In-Band and Out-Of-Band), Supervision, Data Rate (BERT, Loop Back, etc.), Digit Pulsing (In Service Monitoring), Talk and Monitor functions, Automatic 102 and 105 Tests, and Manual On Hook and Off Hook tests. The lesson initially presents 5ESS Switch input and output messages associated with: the status of trunks, trunk lists, trunk tests, and how to change the operational state of a trunk. The lesson addresses the Circuit Administration State (CADN) and state changes as presented in the Output Messages Manual (235-600-750) Appendix. From this point, the lesson presents different trunk tests from the Trunk Line Work Station (TLWS) poke commands and 5ESS Input Messages. Along with Trunk Testing, this lesson presents a procedure to detect looped facilities. This lesson includes references to Alcatel-Lucent's Dyna Text 5ESS Switch support documentation and relates procedures in the lesson to the documentation.

Lesson 6 Turning Trunks Up For Service

Turning Trunks Up For Service presents Procedures, Tests and 5ESS Status Printout requests that should be performed and requested prior to placing trunks in an In Service state and before routing Call Traffic over them. These procedures can consist of common procedures used and accepted within the telecommunications industry and/or customized with your own company's established procedures. These common procedures consist of: Trunk Status and State verifications; Manual and Automatic Transmission Tests; In-Band and Out-Of-Band Signaling Test Procedures; System Signaling 7 (SS7) Trunk Lists, Verifications and Queries; and Call Through Tests. This lesson includes references to Alcatel-Lucent's Dyna Text 5ESS Switch support documentation and relates procedures in the lesson to the documentation.

Lesson 7 5ESS Trunk Maintenance

This lesson presents Pro-Active 5ESS Trunk Maintenance. This includes the analysis of Trunk failure messages such as Machine Detected Interoffice Irregularities (MDII) messages, System Signaling 7 (SS7) messages, Trunk Error Analysis (TERA) reports, Plant 24 Reports and Transport Facility Performance Monitoring error reports. Each topic includes recommendations of What To Do Next. Alcatel-Lucent's 5ESS documentation is used and referenced throughout this lesson.

Delivery Method

Instructor-Led with numerous Hands-On labs and exercises.

Equipment Requirements

(This applies 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

4 Days