

National Signals Training Consortium

Course Catalog
Summer 2020



 **SIGNALS TRAINING CONSORTIUM**

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Overview

In 2013, public transportation agencies and unions across the country came together to form the National Signals Maintenance Training Consortium (Signals Consortium or Consortium). They were driven to create a full set of standardized national courseware to support training and apprenticeship programs for signal maintainers. Member locations listed multiple reasons for their involvement from addressing retirements and expansions to increasing safety for both the riding public and frontline workers. Some even felt that being involved in such an effort and using the resulting courseware would decrease their liability if an accident were to happen.

Since then, over 65 signals maintenance subject matter experts (SMEs) from 26 member agencies and unions worked with instructional systems designers from the Transportation Learning Center to create over 500 hours of training materials.

Consortium courses cover maintenance training of eight signals subsystems: Track Circuits, Switches and Derails, Train Stops, Grade Crossings, Signals, Interlockings, Power Distribution, and Control Panels. Each course contains participant guides, instructor guides, PowerPoint presentations and assessments. Additionally, the Signals Consortium has developed Orientation to Signal Maintenance; Microprocessors in Signal Systems; Installation and Construction Standards; Signals Train-the-Trainer and a library of checklists and instructional videos to be used for refresher training.

The list of courseware as of Summer 2020 is listed in this document. The materials themselves are available at

<https://www.transittraining.net/courseware/rail/category/signals-maintenance>

Member Locations of the Signals Consortium (2020)

Current Members of the National Signals Training Consortium			
BART	SEIU 1021	Metra	BRS
CATS		MetroTransit	ATU 1005
Capitol Metro		MD MTA	ATU 1300
DART	ATU 1338	NFTA	ATU 1342
Denver RTD	ATU 1001	PATCO	IBT 676
GCRTA	ATU 268	SacRT	IBEW 1245
IBEW Local 103 Boston		San Jose VTA	SEIU 521
LACMTA	ATU 1277	SEPTA	TWU 234
MBTA	IBEW 103	Sound Transit	ATU 587

Key accomplishments by the Consortium include:

- Development of more than 350 hours of **classroom ready courseware** (28 courses) for the background knowledge, safety procedures, inspection and maintenance, and troubleshooting of signaling sub-systems including the following. See Figure 1 Courseware Map for more information:
 - Track Circuits
 - Switches and Derails
 - Train Stops
 - Highway Grade Crossings
 - Cab and Waysides Signaling Systems
 - Interlockings
 - Power Distribution
 - Control Panels
 - Microprocessor-Based Signaling Systems
 - Networking and Communications
- 11 in-person Consortium meetings where SMEs from member locations engage in concentrated courseware development with the Center's Instructional Designers and shared best practices around training techniques, mentoring practices, assessments, etc.
- Drafted an apprenticeship framework that was accepted by the United States Department of Labor
- Developed and delivered a Train-the-Trainer program
- Achieved college credit recommendation from NCCRS
- Developed mentor checklists and videos to be used for refresher training
- Kept membership strong after initial phase of work
- One Consortium-wide Train-the-Trainer for signals maintenance instructors

For more information on the Signals Training Consortium, contact Julie Deibel-Pundt at jdeibel@transportcenter.org.

Figure 1 Courseware Map

Topic	100 Level Intro and Overview	200 Level Inspection & Maintenance	300 Level Testing, Troubleshooting & Repair/Replacement
Pre Requisites: Computer literacy, Electrical theory / Principles of electrical or electronic circuitry (ohm's law, parallel circuits, etc), First aid and safety practices: are trained on the property, every year, Math – High school GED level math, Reading – High school GED level reading/writing, Ability to read/understand electrical Schematic/Diagrams, Valid Driver's license (some require CDL), Pass mechanical aptitude test (as per Ramsey, Barrett), Safety practices around electricity, Series/parallel circuits, Use and care of basic hand tools, Use of multimeters, oscilloscopes, and frequency meters, Agility Test (fear of heights, confined spaces, etc.)			
Overview	100 Orientation History, RWP, Regulations, Principles of Operation, Nomenclature, Relay Logic, Location Specific Rules	Not Applicable	Not Applicable
Track Circuits	101 Intro and Overview to Track Circuits	201 Track Circuit Inspection and Maintenance	301 Troubleshooting and Repair of Track Circuits
Switches & Derails	102 Intro and Overview to Switches and Derails	202 Switch and Derail Inspection and Maintenance	302 Troubleshooting and Repair of Switches and Derails
Train Stops	103 Intro and Overview to Train Stops	203 Train Stops Inspection and Maintenance	303 Troubleshooting and Repair of Train Stops
Grade Crossing	104 Intro and Overview to Grade Crossings	204 Grade Crossing Inspection and Maintenance	304 Troubleshooting and Repair of Grade Crossings
Signals	105 Intro and Overview to Cab and Wayside Signaling	205 Cab and Wayside Signaling Inspection and Maintenance	305 Troubleshooting and Repair of Cab and Wayside Signals
Interlocking	106 Intro and Overview to Interlockings	206 Interlocking Inspection and Maintenance	306 Troubleshooting and Repair of Interlockings
Power Distribution	107 Introduction and Overview to Power Distribution Systems	207 Power Distribution Inspection and Maintenance	307 Troubleshooting and Repair of Power Distribution Systems
Control Panels	108 Intro and Overview to Control Panels	208 Control Panel Inspection and Maintenance	308 Troubleshooting and Repair of Control Panels
C250: Installation and Construction Standards			
C350: Microprocessor Based Signaling Equipments			
C351: Networking and Communications			
			Refresher Training
			Refresher Training
			Refresher Training

Courseware Complete

Content in Progress

100 Level Courses

Course 100: Orientation

Course Description

Where to access the course: <https://www.transittraining.net/courseware/details/course-100-orientation>

Total Instruction	26 hours, 20 minutes
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Module 1: Introduction to Signaling and Train Control

Outcome: Participants will understand and be able to describe signaling and train control principles as they relate to their work as a signal maintainer including railroad signaling evolution, job safety requirements, governing agencies/authorities and key principles such as fail-safe, vital and non-vital.

🕒 Duration of this Module: 240 minutes

✍️ This Module has a Quiz

Learning Objectives

Following the completion of this Module, the participant should be able to complete the objectives with an accuracy of 70% or greater.

- Explain the purpose of a signaling system
- Explain the evolution of railroad signaling
- Specify how signal maintainers are responsible for the safety of the general public
- Identify the importance of Agency and governing location operating rules/policies
- Define “fail-safe”
- Explain why systems have to fail in a safe manner
- Differentiate between vital and non-vital
- Discuss future technologies, such as PTC

Module 2: Roadway Worker Protection and On-Track Safety

Outcome: Participants will understand and be able to describe Right-of-Way (ROW) and on-track safety principles as they relate to their job as a signal maintainer including rail roadway worker protection, on-track safety and communication protocol.

🕒 Duration of this Module: 180 minutes

✍️ This Module has a Quiz