Rail Vehicles Maintenance Training Standards

Abstract: This Recommended Practice establishes standards for a program of rail vehicles maintenance training.

Keywords: training, rail vehicles

Summary: In response to the transit industry’s need for rail vehicles maintenance training, the Transportation Learning Center has partnered with APTA, transit agencies and unions representing transit workers to develop these joint labor-management training guidelines and recommended training practices.

Scope and purpose: The curriculum, courseware and training guidelines adopted by the group and contained in this Recommended Practice are designed to meet or exceed the licensing requirements of jurisdictions, which currently or in the future, may legislate professional licensure or certification for rail vehicle technicians. The apprenticeship program will ultimately be registered by the U.S. Department of Labor’s Office of Apprenticeship.
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APTA appreciates the Vehicles Training Joint Steering Committee, which provided the primary effort in the drafting of this Recommended Practice:

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1. Objective of this standard

Public transportation faces a technical skills shortage driven by changing technologies, shifting workforce demographics, record-breaking growth in ridership and the continuing expansion of transit systems and users. Industry leaders acknowledge that the pace of technological change has surpassed the capacity of most agencies to train skilled technicians and new entrants/employees in the effective diagnosis, repair and maintenance of advanced capital equipment. To address many of these issues, labor-management partnerships have been advocated in a number of blue-ribbon reports (see References) from the Transportation Research Board and its Transit Cooperative Research Program (TCRP) as well as from the American Public Transportation Association (APTA).

1.1 The Steering Committee

The development of recommended training guidelines was coordinated through a joint labor-management Steering Committee of subject matter experts drawn from rail transit agencies across the country. Table 1 lists the participants.

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Other participants: APTA, ATU International

Meeting over a period of two years, this committee of management and labor subject matter experts:

- Determined the job responsibilities and related tasks required of rail vehicles mechanics.
- Determined the skills, knowledge and abilities required to successfully execute the job responsibilities and tasks of the craft.
- Developed a program of training and order of instruction for classroom and on the job training.
2. Rail vehicles maintenance training guidelines

The safe and efficient operation of transit rail systems is highly dependent on having fully operational rail vehicles to satisfy schedule needs. As with most transit and rail occupations, a shortage of skilled vehicle mechanics exists. The inadequate numbers of rail vehicle maintainers is attributed to several factors, including the pending retirement of incumbent workers, the continued expansion of rail transit systems nationwide and inadequate recruitment and training of mechanics. The difficulty recruiting new entrants into the field is exacerbated by the need to require shift work of newer employees.

In response to the need which the transit industry expressed for rail vehicles maintenance training, the Transportation Learning Center has partnered with APTA, transit agencies and unions representing transit workers to develop joint labor-management training guidelines and recommended training practices. The development of these training guidelines was supported through grants from the U.S. Department of Labor, the Federal Transit Administration and the Transit Cooperative Research Program. Specifically, TCRP project E-7 deals with the researching and development of a national certification program for rail vehicle mechanics.

Rail vehicles maintenance training guidelines are organized into 12 subject areas corresponding to the different job responsibilities of a rail signal maintenance technician. These subject areas:

1. Couplers
2. Truck and axle
3. Propulsion and dynamic braking
4. Auxiliary inverters and batteries
5. Friction brakes
6. HVAC
7. Current collection and distribution
8. Monitoring and diagnosing
9. Car body
10. Doors
11. Communications systems
12. ATP-ATO

The labor-management subject matter experts on the Vehicles Training Joint Steering Committee developed the training curriculum and guidelines with the expectation that training would be instructor-led and include on-the-job training under the supervision of an experienced and qualified journeyman or technician.

2.1 100-level courses: Fundamental Skills for Transit Maintenance

100. Property-specific orientation (including track safety, flagging, emergency evacuation)
101. Orientation and background
   - 101-1. General Safety Overview
     Name the agencies and organizations that make and enforce safety regulations
     Name several electrical shock hazards and the techniques used to prevent those hazards
     Name the four classes of fire and how to extinguish them
     Describe the technique used to lift a heavy load
     Explain the importance of PPE and name several types
     Explain what MSDS stands for and how it applies, RtK
     Confined space training
• **101-2. Customer Service**
  Crowd control
  Operational signage

• **101-3. System Security**
  Presentation by jurisdiction security force

• **101-4. Station Orientation**
  Explain how to use the transit system and locate all stations

• **101-5. Safety and Emergency Procedures**
  Explain how to reach both internal and external emergency service personnel

• **101-6. Public Safety**
  Demonstrate the proper barricade setup for both elevator and escalators

### 102. Electrical and Job Safety

• **102-1. Developing a Safe Attitude**
  Safety overview; personal responsibility

• **102-2. Using Personal Protective Equipment (PPE)**
  Discuss safety rules concerning PPE
  Determine when and what PPE is required for a job
  Demonstrate the proper use of various PPE
  Explain the proper care and storage of PPE

• **102-3. Understanding Electrical Safety**
  State (by jurisdiction) electrical safety rules
  Explain basic electrical concepts of current, voltage, resistance and insulation
  Discuss the hazards of electricity
  Discuss methods used to prevent electrical accidents
  Use scientific notation and metric measurements

• **102-4. Lockout/Tagout**
  Discuss the importance of using correct lockout/tagout procedures
  Identify various types of lockout and tagout devices
  Explain how to use lockout/tagout devices

• **102-5. MSDS (right to know)**
  Recognize the importance of safety and its priority
  Discuss OSHA laws and their relation to authority
  Explain how chemicals in the workplace can be a hazard
  Obtain and use material safety data sheets
  Properly label, store and dispose of hazardous chemicals
  Discuss methods used to determine exposure to hazardous substances, and how to minimize harmful effects

### 103. Tools and Material Handling

• **103-1. Basic Hand Tools**
  Measuring tools:
  - Explain how to hold a rigid rule correctly when measuring an object and show from which point the measurement begins
  - Describe how to set lock joint transfer-type calipers
  - Identify vernier calipers
  - Explain how to take a measurement with a micrometer caliper
  - Name the parts of a combination square

  Wrenches and screwdrivers:
  - Identify types of materials used for making wrenches