

SMATV – SIGNAL DISTRIBUTION SYSTEMS 2004-5

COMPETENCIES listing (for NCEE)

Proposed Skills Standards and Competencies for workers studying to become satellite systems installers and technicians, as well as for use as a curriculum outline for educational institutions providing training for satellite industry personnel.

1.0 Head-end Components and Environment

- 1.1 Describe differences between consumer and commercial satellite receivers
- 1.2 Describe equipment used for off-air TV signal reception
- 1.3 Explain power requirements and UPS equipment
- 1.4 Explain how combiners work and how splitters may be used in their place
- 1.5 Describe heating-cooling requirements for head-end rooms
- 1.6 List problems caused by rodents and insect pests in head-ends
- 1.7 Describe channel deletion hardware
- 1.8 Describe different methods to provide backup power during outages
- 1.9 Explain why distribution or line amplifiers are required in SMATV systems
- 1.10 Describe the functions of band-pass filters and channel deletion filters
- 1.11 List all of the components required for proper lightning protection at the head-end
- 1.12 List the advantages of marking head-end equipment

2.0 Head-end Signal Balancing

- 2.1 List the uses of signal-level meters with head-end equipment
- 2.2 Identify head-end signals and signal levels using a spectrum analyzer
- 2.3 Explain requirements for audio levels
- 2.4 List problems that may occur with out-of-range video levels
- 2.5 Explain FCC rules for signal levels, aircraft frequencies and leakage
- 2.6 Describe proper bonding and grounding of head-end equipment
- 2.7 List causes of hum in channel video audio signals
- 2.8 Describe overdrive and list causes
- 2.9 Explain reasons for proper documentation of head-end signals

3.0 Underground – Overhead Cabling

- 3.1 List locations conduit is often used for distribution cabling
- 3.2 Explain how boring and trenching is accomplished
- 3.3 Describe splicing hardware and waterproofing techniques
- 3.4 Define 'Messenger' cable and drop cabling
- 3.5 List the tools needed and technology of Hard Line connectors
- 3.6 List reasons for using tilt devices
- 3.7 Describe how mid-span power insertion is accomplished

4.0 Multi-channel Signal Combining

- 4.1 Explain the difference between powered and non-powered combiners
- 4.2 Explain how channel deletion and conversion equipment is used
- 4.3 Describe methods of location and reducing interference
- 4.4 List uses for channel traps
- 4.5 Explain the need for balancing the channel levels throughout the system

5.0 UPS, Uninterruptible Power Supplies

- 5.1 Explain why temporary AC power may be needed
- 5.2 Explain the advantages of DC power-bus instead of AC UPS systems
- 5.3 Explain how gasoline-powered generators are used for power back up

6.0 Daisy Chain Cabling Technology

- 6.1 Draw a SMATV distribution system and show signal-power budget
- 6.2 List daisy chain system components
- 6.3 Explain how taps, splitters and terminators are used
- 6.4 Describe where and how line amplifiers may be used

7.0 SMATV Trunk and Feeder Line Components

- 7.1 Properly install a hard-line connector
- 7.2 Describe a Telecommunications pedestal and show how it is installed
- 7.3 Describe junction boxes where multiple subscriber drops may converge
- 7.4 Explain attic and crawl space hazards
- 7.5 Define strand and lashing cable and list where they are used
- 7.6 Explain when contracting underground or overhead plant is the best decision
- 7.7 Describe pole-mounted taps, splitters, tilt hardware
- 7.8 Explain AC power budgeting

8.0 Test Equipment and Troubleshooting

- 8.1 Demonstrate how to use a signal level meter
- 8.2 Explain the use of a TDR – Time domain reflectometer
- 8.3 List situations where signal injection equipment is required in troubleshooting
- 8.4 List 10 situations where a DMM is used in troubleshooting a system
- 8.5 Explain how 2-way radio communications can aid a crew in troubleshooting
- 8.6 Explain how signal leakage detectors work
- 8.7 List types of Interference detector equipment
- 8.8 Explain how substitution of equipment may be the quickest method of locating system defects

9.0 Home Run Installation Techniques

- 9.1 Identify the TIA-EIA standard for routing cables
- 9.2 Compare various multi-splitters used in SMATV systems
- 9.3 Describe traps and subscriber disconnect methods
- 9.4 Describe drop verification methods and documentation requirements
- 9.5 Explain the importance of labeling system components and drops

10.0 Programming Providers

- 10.1 Explain how to contract directly with program providers
- 10.2 List wholesale SMATV programming providers and the benefits of using
- 10.3 Explain transport service for SMATV systems
- 10.3 List special equipment requirements needed for subscriber services offered by SMATV system operators

11.0 Line Sweeping, TDR, OTDR, FDR Equipment

- 11.1 List problems caused by inadequate head end integrity
- 11.2 List ways to locate shorts and opens in cabling
- 11.3 Explain the need for proper cable terminations
- 11.4 List reasons for cable anomalies and types of problems they cause
- 11.5 Describe proper power wiring
- 11.6 Describe fiber optic cabling safety concerns
- 11.7 Describe various types of cabling jumpers and common problems
- 11.8 Explain where and why gas filled transmission lines may be used