

Video Security Systems Technician

NICET

Level I Certification

Content Outline

National
Institute for
Certification in
Engineering
Technologies



Introduction

The purpose of this certification program is to recognize the professionalism of qualified technicians and provide a way for others to distinguish those technicians who have demonstrated job knowledge and work experience. NICET will do this by defining and testing relevant knowledge and evaluating experience.

This document presents the content that is covered in the examination and other criteria for certification as a Video Security Systems Technician at Level I. This program is based on an analysis of the tasks that are performed by a competent technician. The content outline is a listing of tasks that should be performed well by a Level I certified Technician. Also included are knowledge and skills needed to succeed at each task. These tasks are the focus of the test questions that make up the Level I exam.

The tasks are grouped into larger areas of responsibilities, or “domains”. The domains are:

- Project Planning (No tasks at Level I)
- System Installation
- System Testing and Commissioning
- Troubleshooting
- Planning and Conducting User Training (No tasks at Level I)
- Documentation
- Project Management (No tasks at Level I)

A general description or profile of a Level I Technician includes the following characteristics:

Education: Formal education not required but educational experiences at least equivalent to a high school diploma are expected.

Work Experience: A minimum of 3 months of video systems installation and maintenance activities in an employment setting.

Responsibility: Work under direct supervision. Scope of work is restricted to assisting a more experienced technician.

Acquired Competencies: Assist in simple installation tasks such as camera mounts and cable runs. Read plans. Use simple hand and power tools and basic electronic test equipment.

Tasks Performed by the Level I Technician

1.1 “*Project Planning*” Tasks

None at this Level

1.2 “*System Installation*” Tasks

1.2.1 Follow safe worksite practices.

Knowledge:

OSHA publication 2202 – “Construction Industry Digest”

OSHA publication 3080 – “Hand and Power Tools”

Skills:

Safely place and use ladders and scaffolding

Safely use power tools in Level I Tool Kit

1.2.2 Follow safe low voltage electrical practices.

Knowledge:

Personal safety implications of class 1, 2, and 3 voltages

OSHA publication 3007 – “Ground Fault Protection”

Skills:

Recognize wires carrying different voltage classes.

Safely use soldering equipment.

1.2.3 Install correct coaxial and twisted pair video cables with terminations.

Knowledge:

Proper cable pulling techniques and tools, including maximum cable strength in lbs. for coaxial cable, category 5, and power lines (16, 18, and 22 Awg twisted pair), and maximum bend recommendations

Difference between coaxial cable for CCTV and for modulated signals

Difference between cables for plenum and non-plenum areas

Distance limitations of cable types

Connectors required for termination of video cables, including BNC, RCA, and PL2

Which crimping tools to use in properly terminating video cables

Skills:

Read and interpret shop plans, architectural drawings, and blueprints as necessary for cable location and identification.

Recognize inappropriate cable hangers.

Recognize physical hazards that could threaten the integrity or function of the cable

Identify cable by name, type, number, and suffix.

Use a tone generator and inductive probe to identify cables.

Properly use crimping tools for terminating video cables.

Properly select and use tools from the Level I toolkit for cable installation.

Recognize and report problems

1.2.4 Install camera mounts.

Knowledge:

Properties of wood, steel, concrete, and drywall mounting surfaces and the appropriate hardware for each

OSHA publication 3080 – “Hand and Power Tools”

Skills:

Apply basic construction techniques necessary to mount cameras and associated hardware.

Properly select and use tools from the Level I toolkit.

Recognize and report problems

1.2.5 Assemble camera hardware and place assembled camera on mount.

Knowledge:

Correct orientation of lens and camera for proper functioning

Basic mechanical requirements for mounting a fixed camera

Skills:

Properly select and use tools from the Level I toolkit.

Properly mate a lens to a camera.

Properly adjust lens focus on camera for best image.

Recognize and report problems

1.2.6 Make low voltage power connections.

Knowledge:

Applications of series and parallel circuits

Electrical units such as volt, ohm, amp, watt, and hertz

Proper equipment applications for various power connectors (see Appendix)

Power connection requirements for proper phasing of cameras

Skills:

Identify the proper cable and connection point for the requested connection.

Use a tone generator and inductive probe to identify power cables.

Select and properly use the correct tools and equipment for general low voltage connection points and splice connectors.

Read and interpret shop plans, architectural drawings, and blueprints as necessary for proper power connections.

Properly protect connection points.

Recognize and report problems

1.2.7 Make low voltage splices and junctions.

Knowledge:

Types of low voltage splices and junctions and the function and proper assembly of each

Skills:

Properly select and use tools from the Level I toolkit to access, make, and manipulate splices and junctions.

Properly use VOM/DVM in checking splices and junctions.

Read shop plans to determine locations in facility.

Recognize and report problems

1.2.8 Assemble cabinets and racks and mount equipment.

Knowledge:

ANSI/EIA-310-D rack unit standards and how they affect cabinet dimensions and space requirements

Thermal and ergonomic considerations in the proper placement of equipment

Skills:

Properly select and use tools from the Level I toolkit.

Provide proper service loops.

Label and organize power, data, video, and other cables within a control panel or splice box to insure easy access and identification.

Recognize and report problems

1.3 “System Testing and Commissioning” Tasks

1.3.1 Verify cable labeling and check cable continuity and point-to-point continuity

Knowledge:

Characteristics of series, parallel, closed, open, short, and grounded circuits

Skills:

Read and interpret shop plans as necessary for cable location and identification.

Identify the proper points on the electrical pathway to take requested measurements.

Determine cable path, length, and purpose.

Locate splices, taps, and patch points.

Use a VOM/DVM, toner and inductive probe, and/or telephone test set in testing and checking continuity.

1.4 “*Troubleshooting*” Tasks

1.4.1 Locate basic cable faults.

Knowledge:

Characteristics of low voltage circuits, including series and parallel, open, short, and grounded circuits

Electrical units including volt, amp, and ohm

Factors that can cause various types of cable faults

Skills:

Properly select and use tools from the Level I toolkit to access and manipulate cable.

Properly use multimeters, toner and inductive probes, telephone test sets, and/or portable monitors for finding faults in cables, including junctions, splices and termination connection points.

Determine cable path from shop plans.

1.5 “*Planning and Conducting User Training*” Tasks

None at this level

1.6 “*Documentation*” Tasks

Note: The letters following some tasks indicate for whom the documentation is required:

S = Shop, C = Customer, G = Government

1.6.1 Locate standard job documentation needed for the installation process.

Knowledge:

Purposes of blueprints, shop drawings, wiring legends, schematics, installation and operation manuals, and related technical bulletins and updates

Skills:

Identify each of the documents listed above.

1.6.2 Temporarily mark cable for construction (S)

Knowledge:

Conventional methods for properly labeling cables

Skills:

Read and interpret the appropriate shop drawings, blueprints, and wiring legends to determine cable runs and assigned cable markings.

Correctly and legibly mark cables.

1.6.3 Record serial numbers of installed devices. (SC)

Knowledge:

Purpose for recording serial numbers

Skills:

Locate and recognize serial numbers on various pieces of equipment.

1.6.4 Recover and store equipment documents.

Knowledge:

Purpose for recovering and storing equipment documents

Skills:

Identify O&E manuals and warranty cards.

1.7 “*Project Management*” Tasks

None at this Level

Appendix A: Acronyms and Abbreviations

Codes and Standards

BICSI	Building Industry Consulting Service International
CSI	Construction Specification Institute
FCC	Federal Communications Commission
IEEE	Institute of Electrical and Electronics Engineers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
SIA	Security Industry Association
UL	Underwriters Laboratories

General

AGC	Automatic Gain Control
dB	deciBel
DSS	Digital Slow Shutter
DVD	Digital Video Disk
DVM	Digital Volt Meter
DVR	Digital Video Recorder
GLC	Ground Loop Correction
HD	High Density
HVAC	Heating, Ventilating, and Air Conditioning
I/O	Input/Output
IR	InfraRed
IRE	Institute of Radio Engineers (unit of measure)
IT	Information Technology
LAN	Local Area Network
MATV	Master Antenna TeleVision
OTDR	Optical Transducer Directional Reflectometer
PIR	Pulsed InfraRed
RF	Radio Frequency
SVHS	Super Video Home System
UHF	Ultra High Frequency
VCR	Video Cassette Recorder
VHF	Very High Frequency
VHS	Video Home System
VOM	Volt-Ohm Meter
WAN	Wide Area Network

Appendix B: Level I Installer's Toolkit

The NICET Level I task descriptions assume that Level I video systems installers would be familiar with the names, proper usage, and safety considerations for the following tools:

Hand-Tools:

Screwdrivers:

- # 1, 2, 3 flat blades
- # 1, 2, 3, Phillips
- Jeweler's flat blades
- Jeweler's Phillips

Hammer

12" bubble level

Standard set sockets

Razor knife

Flashlight

Wire Snake

Flexible wire-puller

Pliers/wire cutters

Power Tools:

Professional, Heavy duty ½" Hammer Drill

Set of concrete bits: 1/8" to ½"

½ Standard power drill

Set of paddle wood bits: 1/4" to 1"

Set of metal bits: 1/8" to ½"

Screwdriver bits

Solder Iron (electric)

Solder Iron (Butane)

Specialty tools:

BNC Crimper (RG59, RG6 3-Piece Dies)

BNC cable stripper

Tone generator/inductive probe

Medium duty 2" needle nose pliers

Light duty 3" needle nose pliers

General duty pliers

Adjustable channel lock

Heavy duty wire cutter

Light duty wire cutter

Spade/lug crimping tool

Meters:

Digital volt meter (DVM) and/or

Digital volt/ohm meter (DVOM)

2.5" to 5" hand held video monitor or PDA