



Firearms Section
NIBIN Technician Training Manual
Comparative & Analytical Division



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Introduction to Student

Welcome to the Houston Forensic Science Center. As a NIBIN Technician trainee, you have met the minimum educational, experience, and skills requirements as required by the job posting and have passed a background check and drug screening. This training program will guide you through the various areas of knowledge integral to the field of ballistic imaging. It is paramount that you keep before you the objectives of this training period:

- Independently and competently function test firearms,
- Test fire firearms,
- Recover test fired specimens,
- Evaluate fired cartridge cases for NIBIN entry,
- Enter fired cartridge cases into NIBIN,
- Review correlations in NIBIN and identify NIBIN leads,
- Complete duties in a professional, ethical, competent and impartial manner.

The obligation is yours to maximize the effectiveness of the training period as an opportunity to learn substantial, valuable, and applicable information pertaining to this field. The extent to which you exert yourself during this training and evaluation period will bear directly on the quality of your performance in the laboratory. You have a moral and ethical obligation to prepare yourself technically and professionally during training to be able to perform according to the standards of the Houston Forensic Science Center (HFSC).

This training program provides a framework for addressing the most important part of your training. This on-the-job, hands-on experience is the core of your training and you will be assigned to work with one or more Principal Instructors during your training period. Principle Instructors are qualified analysts/technicians authorized to perform the tasks you are being trained to do and/or have completed training and have practical experience on the same topics. This will ensure that you have sufficiently covered each aspect of this training program and have a basis for continued development after your initial qualification. Your training will be monitored and assisted by your Principal Instructors, who have primary responsibility for training matters.

You will be expected to read and understand the Firearms Section's Standard Operating Procedures, the HFSC Quality Assurance Manual, and the HFSC Safety Manual, company policies and procedures, as well as print, video, and physical reference files. Integral to your course of study will be frequent daily contacts with section personnel with special expertise in certain areas. Do not hesitate to ask anyone a question, whether a supervisor or examiner.

Your study will include many printed references or electronic versions of printed references, including the basic material listed within each area of study. It is expected that during the training



period you will become thoroughly familiar with these basic references. Further, it should be noted that you should not restrict your efforts and research to those required references. One of your primary sources of additional information will be the section's reference library. Familiarize yourself with the library's contents, including the reference files, related indices, manufacturers' literature, and the journal of the Association of Firearm and Toolmark Examiners.

In addition to maintenance of this manual, you will be required to keep a record of your study notes on each of the items shown in the training program. This record can include hand or type-written notes, charts, graphs, photographs, photocopied material, etc. Your training record must address and broaden on each of the required items of study set out in the training program and include the number of hours or days you spend on training (this may be in the form of a calendar or a training schedule). Organization of your records in a format that parallels the training program is suggested. This record will assist the documentation of your progress during training and serve as a ready reference in the months and even years following the completion of training.

As you progress through the training program, you will have several opportunities to establish competency. NIBIN Technicians are commonly competency tested in: function testing and test firing firearms, evaluating test fires for NIBIN entry, evaluating fired evidence (other than test fires) for NIBIN entry, acquiring items into NIBIN, and reviewing NIBIN correlations. Specific requirements for each competency are listed within the training manual. NIBIN Technicians may demonstrate competency and obtain authorization to do work all at once, or in stages, as appropriate for the needs of the student, principal trainers, and the section. If section needs dictate that a trainee establish competency in a sub-section/area, the requirements for establishing competency will be developed by Section Management, documented, and provided to the trainee prior to being given the competency test.

Written tests or quizzes require a grade of 80% or greater to pass. If a passing grade is not obtained, you will be required to answer the same (or similar) questions verbally to the satisfaction of the trainer. If the oral answers are not satisfactory, the trainer will identify practical exercises (either from the training manual or in addition to those found in the manual) that may assist you in understanding the topics covered by the quiz/test. Once you have completed those exercises, you will repeat the quiz/test.

Before being authorized to do independent casework, a trainee must pass an oral exam. The oral exam questions will be determined by Section Management. The goal of the oral exam is to evaluate your ability to communicate effectively in a courtroom setting as well as evaluate the fundamental knowledge you need to carry out day-to-day job duties. The oral examination questions may cover any aspect of Units 1 and 4, as well as any topic for which you are seeking or have already established competency. More than one oral exam may be given if you are authorized



for independent casework in stages. Each question will be evaluated by Section Management as satisfactory, not satisfactory, or needs improvement. For any answer deemed not satisfactory, you will be required to answer the same (or similar) question in writing to the satisfaction of Section Management. If more than 20% of the questions answered have a needs improvement rating, you will have an attempt to answer the “needs improvement” questions again. If either the written or oral answers are still not satisfactory, Section Management will identify practical exercise (either from the training manual or in addition to those found in the manual) that may assist you in understanding the topics covered. Once you have completed those exercises, you will repeat the oral exam.

If at any point in your training you do not feel that the training has been adequate for you to fully understand the topic(s) covered, it is your duty to notify your trainer and/or a member of Section Management. Never attempt to complete a competency test, written quiz/test, or oral exam if you do not feel fully prepared.

Due to restrictions in the function of a Firearms/Toolmark Technician as defined in §651.202 of the Texas Administrative Code, NIBIN Technicians are not expected to testify regarding the results of NIBIN processing. However, they may be called to testify about chain of custody issues or basic NIBIN entry information. If they are called to testify, a mock trial will be completed at that time.



1. Administrative Orientation

1.1. Sections

- 1.1.1. Houston Forensic Science Center (HFSC) New Hire Orientation
- 1.1.2. HFSC Tour
- 1.1.3. Firearms Section In-Processing

1.2. Training Objectives

To provide the student with an understanding of the mission and operation of HFSC, the operation of the Firearms Section, and ethics in forensic science.

1.3. Method of Evaluation

Oral discussion

1.4. Training Methods

- 1.4.1. Self-directed study
- 1.4.2. Discussion
- 1.4.3. Tour of some or all sections of HFSC
- 1.4.4. HFSC New Hire Orientation (if applicable)

1.5. Practical Exercise

1.5.1. Houston Forensic Science Center (HFSC) New Hire Orientation

The student will attend the HFSC New Hire Orientation if he/she is a new hire. If the student transferred from another section within HFSC, this step is not needed. New Hire Orientation is documented by Human Resources.

1.5.2. HFSC Tour

- 1.5.2.1. The student will receive a tour of HFSC facilities pertinent to his/her daily activities as a NIBIN Technician. Other areas/facilities may also be included.

Principal Instructor Signature and Date

1.5.3. Firearms Section In-Processing

- 1.5.3.1. The student will read the HFSC Quality Manual and discuss with the Principal Instructor in the context of the job duties of a NIBIN technician.

Principal Instructor Signature and Date



1.5.3.2. The student will read the section's Standard Operating Procedures and discuss the section's mission with the Principal Instructor.

Principal Instructor Signature and Date

1.5.3.3. The student will read HFSC policies and procedures as required by HFSC New Employee On-Boarding and/or at the discretion of the Section Manager or Supervisor. Each manual, policy, and/or procedure read by the student must be documented.

Principal Instructor Signature and Date

1.5.3.4. The student will discuss ethics in forensic science with the Principal Instructor. The student will read the HFSC Code of Ethics, any ethics document issued by HFSC's accrediting bodies, (e.g., ANAB and/or TFSC), and any ethics document issued by the Association of Firearm and Toolmark Examiners with the Principal Instructor.

Principal Instructor Signature and Date

1.5.3.5. The student will define the difference between accreditation, certification, and licensing and discuss these differences with the principle instructor.

Principal Instructor Signature and Date

1.5.3.6. The student will define what kind of organization HFSC is, as well as how it is similar and different from other crime laboratories in the United States and discuss this with the principal instructor.

Principal Instructor Signature and Date

1.6. Reading

1.6.1. Required Reading

- HFSC Quality Manual
- Firearms Section Standard Operating Procedures



- HFSC Health and Safety Manual
- HFSC Security Manual
- HFSC Corporate Policies and Procedures
- ANAB Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists
- AFTE Code of Ethics
- All reading, etc. listed by TFSC as required for the Professional Responsibility of the Technician License Exam.

Student Signature and Date of Reading Completion

1.7. Terminology

Common Acronyms

HFSC	Houston Forensic Science Center
TFSC	Texas Forensic Science Commission
SOP	Standard Operating Procedures
ANSI	American National Standards Institute
ANAB	American National Standards Institute (ANSI) National Accreditation Board
AFTE	Association of Firearm and Toolmark Examiners

1.8. Estimated Training Time

50 hours



2. Firearm Functionality, Assembly, and Disassembly

2.1. Sections

- 2.1.1. Safe Firearm Handling
- 2.1.2. Firearm Terminology and Identification
- 2.1.3. Handguns (Semiautomatic and Full Automatic)
- 2.1.4. Rifles and Carbines (Semiautomatic and Full Automatic)
- 2.1.5. Shotguns (Pump Action and Semiautomatic)

2.2. Training Objectives

To develop in the student a thorough knowledge of semiautomatic/full automatic handguns, semiautomatic/full automatic rifles, as well as pump action and semiautomatic shotguns so that he/she will know how to assemble and disassemble these firearm types, be familiar with firearm safety designs, and have a knowledge of operability of those weapons most frequently encountered. In addition, a working knowledge of firearm terminology will be developed. **This unit does not address test firing weapons.**

2.3. Method of Evaluation

- 2.3.1. Discussion
- 2.3.2. Written/practical exercises
- 2.3.3. Manual demonstration

2.4. Training Method

- 2.4.1. Reading
- 2.4.2. Discussion
- 2.4.3. Practical exercises

2.5. Practical Exercises

In the following practical exercises involving the disassembly of firearms, substitutions of similar types, makes, and models shall be used if any of the listed firearms cannot be obtained. The use of the section's videos is recommended if a particular firearm is not available. Use of various assembly/disassembly guides is recommended.

2.5.1. Safe Firearm Handling

- 2.5.1.1. Review safe firearm handling rules with your Principal Instructor. Demonstrate your ability to safely handle firearms to the satisfaction of your Principle Instructor.

Principal Instructor Signature and Date

2.5.2. Firearm Terminology and Identification



2.5.2.1. Explain and illustrate the similarities and differences between the following types of firearms:

- Shotgun
- Rifle
- Handgun
- Long gun
- Pistol
- Revolver

Principal Instructor Signature and Date

2.5.2.2. Explain and illustrate the differences between the operations of the following types of actions found in pistols, rifles, and shotguns. Include the loading of cartridges, and the subsequent movement of the cartridge case/shotshell and bullet/projectile after firing:

- Blowback action
- Gas operated action
- Recoil operated action
- Pump action
- Automatic action
- Semiautomatic action
- Blow forward action
- Hammer operation
- Bolt action
- Break open action
- Hybrid action
- Double action
- Single action
- Lever action
- Revolver action
- Striker fired

Principal Instructor Signature and Date

2.5.2.3. Define each of the following terms and explain their significance, if any, in the forensic examination of firearms and their accessories.

- Submachine gun
- Assault rifle
- Antique firearm
- Suppressor
- Carbine
- Machine gun
- Curio/relic
- Silencer

Principal Instructor Signature and Date

2.5.2.4. Research, define, and/or determine the implications of the following terms as they relate to safety in the operation of a firearm:

- Inadequate/improper sear engagement
- Bore obstruction
- False half-cock
- Slam fire



- Barrel bulge
- Broken extractor
- Rail splitting
- Hairline cracks
- Defective safety
- Excessive headspacing
- Push off
- Excessive pressure
- Dented barrel
- High primer

Principal Instructor Signature and Date

2.5.2.5. Identify the various types of internal and external safety mechanisms found in pistols, rifles, and shotguns. Learn the manufacturer's nomenclature for each safety mechanism. The AFTE Glossary may be used when needed. Classify each safety as active or passive. Include the following:

- Cross bolt
- Disconnect
- Firing pin block
- Half cock
- Lever
- Manual
- Sliding button
- Thumb
- Trigger lock
- Decocker
- Drop safety
- Grip
- Key lock
- Magazine
- Quarter cock
- Tang
- Wing

Principal Instructor Signature and Date

2.5.2.6. Demonstrate your knowledge of the basic nomenclature of handgun, rifle, and shotgun parts.

2.5.2.6.1. Include, but do not restrict your study to the following:

- Breechface
- Breechbolt
- Bolt
- Bolt face
- Extractor
- Ejector
- Firing pin
- Bore diameter
- Gauge
- Barrel
- Ramp
- Magazine
- Clip
- Ejection port
- Receiver
- Lifter
- Choke
- Pump/slide action

2.5.2.6.2. Point out these parts in several handguns, rifles, and shotguns.



Principal Instructor Signature and Date

2.5.2.7. Review and record the references in the Firearms Section library, which can be used to identify the manufacturer and/or source of a firearm using the following criteria:

- Proof mark
- Part number
- Serial number
- Inspector mark
- Company logo
- Factory number/markings

Principal Instructor Signature and Date

2.5.2.8. Discuss with your Principal Instructor how to conduct an examination to determine if a firearm is capable of firing full automatic. Using firearms that are capable of firing full automatic from a closed bolt and an open bolt, conduct this type of examination and verbally report your findings.

Principal Instructor Signature and Date

2.5.2.9. **If possible, tour the manufacturing facilities of at least one firearms manufacturer. Document your experience and produce a written report of your visit. Emphasis should be placed on manufacturing techniques used by the manufacturer. Note the methods that may leave individual manufacturing tool marks on firearm parts which, in turn, produce individual microscopic marks on cartridge cases. Completion of this exercise is not required to show competency as a NIBIN Technician.**

Principal Instructor Signature and Date

2.5.2.10. **If possible, attend at least one armorer's course covering a firearm typically seen for NIBIN processing. Take notes and ask questions regarding manufacturing practices. Prepare a summary of what you learned. Ideally, a NIBIN Technician should attend an armorer's course for one semiautomatic pistol, one semiautomatic rifle, and one pump action or semiautomatic shotgun. Be prepared to discuss this with your Principal Instructor. Completion of this exercise is not required to show competency as a NIBIN Technician.**



Principal Instructor Signature and Date

2.5.3. Handguns (Semiautomatic and Full Automatic)

2.5.3.1. Function test and identify parts for the following types of firearms (assembly and disassembly should be done to the extent necessary to show an understanding of the operating method/system and how the individual parts interact):

- Single action only recoil operated pistol (i.e. Model 1911/1911A1)
- Blowback operated pistol (i.e. Walther PPK/S)
- Gas operated pistol (i.e. 44 Magnum or 50 AE IMI Desert Eagle)
- Recoil operated double action only pistol (i.e. Glock 17)
- Recoil operated single action/double action pistol (i.e. Beretta 92S)
- Recoil operated pistol with a magazine disconnect (i.e. Browning Hi-Power)
- A single action only blowback pistol (i.e. Raven MP-25)
- Blowback pistol (i.e. SWD/Cobray M-11) (Full Automatic, if available)
- Full automatic submachine gun that fires from open bolt (i.e. Uzi Model A)

Principal Instructor Signature and Date

2.5.3.2. **The trainee must verbally demonstrate their understanding of** at least four of the above listed firearms, including one full automatic firearm, **to the satisfaction of the principal instructor.** The student discusses all the safety features of the included firearms, as well as the operating method/system and how the individual parts interact.

Principal Instructor Signature and Date

2.5.4. Rifles and Carbines (Semiautomatic and Full Automatic)

2.5.4.1. Function test and identify parts for the following types of firearms (assembly and disassembly shall be done to the extent necessary to show an understanding of the operating method/system and how the individual parts interact):

- Gas operated carbine with a crossbolt safety (i.e. M-1 Carbine)
- Gas operated rifle with a trigger guard lever and hammer block (i.e. Ruger Mini-14)
- Gas operated rifle with a trigger guard lever (i.e. AKS/SKS type)
- Gas operated rifle having different firing modes (i.e. AR-15, both selective fire and semiautomatic)
- Full automatic gas operated rifle (i.e. AK 47)



Principal Instructor Signature and Date

2.5.4.2. **The trainee must verbally demonstrate their understanding of** at least four included firearms, including one full automatic rifle, as well as the operating method/system and how the individual parts interact **to the satisfaction of the principal instructor.**

Principal Instructor Signature and Date

2.5.5. Shotguns (Pump Action and Semiautomatic)

2.5.5.1. Function test and identify parts for the following types of firearms (assembly and disassembly should be done to the extent necessary to show an understanding of the operating method/system and how the individual parts interact):

- Gas operated shotgun (e.g., Remington 1100)
- Pump action shotgun with a crossbolt safety (e.g., Remington 870)
- Semiautomatic shotgun (e.g., Winchester 1200)
- Pump action shotgun (e.g., Ithaca 37 or Mossberg 500)
- Browning Auto 5

Principal Instructor Signature and Date

2.5.5.2. **The trainee must verbally demonstrate their understanding of** at least two of the above listed firearms **to the satisfaction of the principal instructor.** The student discusses all the safety features of the included firearms, as well as the operating method/system and how the individual parts interact.

Principal Instructor Signature and Date

2.6. Reading

2.6.1. Required Reading for Firearm Terminology and Identification

- *The Story of Firearm Ignition* by James Edsall; Pioneer Press, 1974.
- *The Age of Firearms, A Pictorial History* by Robert Held; Gun Digest Company, 1970.
- *Cartridges; A Pictorial Digest of Small Arms Ammunition* by Herschel C. Logan; pp. 1-10; Standard Publication, 1959.



- *The Development of Firearms* by H.L. Peterson; Parts 1-3; American Rifleman, March-April-May, 1960.
- *The Complete Handgun* by Ian V. Hogg; – 1300 to the Present; Peerage Books, 1984.
- *The Story of the Gun* on the Arts & Entertainment (A&E) Channel - (Video).
- *Guns and How They Work* by Ian V. Hogg; Everest House (1979); pp. 6-25.
- *The Standard Directory of Proof Marks* by Gerhard Wirncherger; Blacksmith Publishers.
- *Gunmarks* by David Byron Crown Publishers (1979).
- *The Identification and Registration of Firearms* by Vaclav “Jack” Krcma; Charles C. Thomas (1971).

Student Signature and Date of Reading Completion

2.6.2. Required Reading for Handguns (Semiautomatic and Full Automatic)

- *Small Arms of the World, 9th or 10th Edition* by Smith; Chapter 9 and Chapter 12, pp. 179-192.
- *Military Pistols and Revolvers* by Ian V. Hogg; pp. 7-11 and 35-77.
- *American Pistol and Revolver Design and Performance* by L.R. Wallack; Chapters 3 and 4 and pp. 51, 69-70.
- *Book of Pistols & Revolvers* by Smith; pp. 36-43.
- *Guns and How They Work* by Ian V. Hogg; Everest House (1979); pp. 90-107, 118-124.
- *The Worlds Submachine Guns, Vol. I* by Thomas B. Nelson, and Hans B. Lockhaven; T.B.N. Enterprises (1977); pp. 1-28; and briefly review remainder of text as necessary.
- *The Worlds Machine Pistols and Submachine Guns Vol. Ila* by Thomas B. Nelson and Daniel D. Musgrave; T.B.N. Enterprises (1980); Chapter III, pp. 95-104; Chapter V, pp.297-354; Chapter X, pp. 647-658; and briefly review remainder of text as necessary (esp. pp. 407-416, 507-522).
- *The Terrifying Three* by Duncan Long; Paladin Press (1989).

Student Signature and Date of Reading Completion

2.6.3. Required Reading for Rifles and Carbines (Semiautomatic and Full Automatic)

- *Small Arms of the World, 9th or 10th Edition* by Smith; Chapters 7-8.
- *The Book of Rifles* by Smith; Chapter 6 and pp. 86-88.



- Guns and How They Work by Ian V. Hogg; Everest House (1979); pp. 60-67, 80-89, 110-115, 125-157.

Student Signature and Date of Reading Completion

2.6.4. Required Reading for Shotguns (Pump Action and Semiautomatic)

- American Shotgun Design and Performance by L.R. Wallack; Chapters 1-9 and 13.
- NRA Firearms Fact Book, 3rd Edition, pp. 169-181.
- The World’s Fighting Shotguns by Thomas F. Swearingen; Ironside International Publishers (1978); pp. 1-19 and review Chapters 7-8 as necessary.

Student Signature and Date of Reading Completion

2.6.5. Other Reading (as necessary)

- AFTE Journals (as identified by Principal Instructor).
- AFTE Glossary.
- Hatcher’s Notebook by Hatcher, Chapters VII to IX, pp. 180-231.
- Firearms Investigation, Identification, and Evidence by Hatcher, Jury and Weller; The Stackpole Company (1957); Chapter 5, pp. 106-136 and 187-196.
- Firearms Identification Vol. II by J. Howard Mathews; Charles C. Thomas (1962); Part VI, pp. 467-492.
- Firearms Identification Vol. III by J. Howard Mathews; Charles C. Thomas (1962); Part VII, pp. 703-714.
- American Pistol & Revolver Design and Performance by L.R. Wallack; Winchester Press (1978); pp.71-80.
- American Rifle Design and Performance by L.R. Wallack; Winchester Press (1977); pp.71-88.
- Encyclopedia of Modern Firearms, Parts and Assembly, Vol. 1 by F.R. “Bob” Brownell; (1959).

2.7. Terminology

Research the following terms using the AFTE Glossary and discuss each with your Principal Instructor. (If the term is not in the AFTE Glossary, consult with your Principal Instructor on how to research the term.):

2.7.1. Firearm Terminology and Identification

Factory Markings	Inspector Mark	Logo
Part Number	Proof Mark	Serial Number



Principal Instructor Signature and Date

2.7.2. Handguns (Semiautomatic and Full Automatic)

ACP	Autoloading	Barrel
Bore	Bore Diameter	Bullet
Bullet Diameter	Caliber	Cartridge
Cock	Cocking Indicator	Delayed Fire (Hangfire)
Discharge	Firearm	Full Cock
Extraction	Extractor	Full Automatic
Function Testing	Grip Safety	Gunpowder
Gas Operated	Gas Piston	Gas
Half Cock	Hammer	Hammer Strut
Lug, Barrel	Malfunction	Misfire
Magazine	Magazine, Box	Gas Port
Magazine Lock	Magazine Well	Magazine Follower
Magazine, Rotary	Magazine Floorplate	Magazine, Detachable
Muzzle	Obturation	Pistol
NATO Cartridge	Open Bolt System	Muzzle Flash
Projectile	Propellant	Semiautomatic
Stock	Disconnecter	

Principal Instructor Signature and Date

2.7.3. Rifles and Carbines (Semiautomatic and Full Automatic)

Barrel	Bolt Body	Bolt Carrier
Bolt Face	Bolt Handle	Bolt Release
Breech	Breechblock	Breech Bolt
Breech Face	Butt Plate	Feed Ramp
Extraction	Extractor	Full Automatic
Gas Operated	Gas Piston	Gas
Magazine	Magazine, Box	Gas Port
Magazine, Rotary	Magazine Floorplate	Magazine, Detachable
Magazine Lock	Magazine Well	Magazine Follower
NATO Cartridge	Open Bolt System	Muzzle Flash
Firing Pin	Forearm	Function Testing
Hammer	In Battery	Locked
Locking Bolt	Muzzle	Out of Battery



Rifle	Single Action	Stripper Clip
Trigger	Trigger, Double Pull	Trigger Guard
Trigger Pull	Disconnecter	

Principal Instructor Signature and Date

2.7.4. Shotguns (Pump Action and Semiautomatic)

Action, Slide or Pump	Barrel	Barrel Band
Barrel Extension	Barrel Guide	Barrel Length
Barrel Threads	Bore Diameter	Butt
Butt Plate	Carrier	Choke
Choke Tube	Crossbolt	Discharge
Extraction	Forearm	Leading
Lifter	Magazine Plug	Safety, Automatic
Selector	Shotgun	Smooth Bore
Subcaliber Device	Trigger Bar	

Principal Instructor Signature and Date

2.8. Estimated Training Time

312 hours total

2.8.1. Safe Firearm Handling (24 hours)

2.8.2. Firearm Terminology and Identification (72 hours)

2.8.3. Handguns (Semiautomatic and Full Automatic) (72 hours)

2.8.4. Rifles and Carbines (Semiautomatic and Full Automatic) (72 hours)

2.8.5. Shotguns (Pump Action and Semiautomatic) (72 hours)



3. Ammunition Development and Identification/Cartridge Loading and Ballistics

3.1. Sections

- 3.1.1. Cartridge Manufacture and Identification
- 3.1.2. Terminology Used in Cartridge Loading and Ballistics

3.2. Training Objectives

- 3.2.1. To develop in the student a thorough knowledge of the developments of gunpowder and ammunition, the relationship of cartridge improvement to firearm design, manufacturing methods of cartridges, and firearm terminology.
- 3.2.2. To teach the student the terminology used in cartridge loading and ballistics.

3.3. Method of Evaluation

- 3.3.1. Discussion
- 3.3.2. Written/practical exercises

3.4. Training Methods

- 3.4.1. Self-directed study
- 3.4.2. Practical exercises
- 3.4.3. Discussion

3.5. Practical Exercises

- 3.5.1. Cartridge Manufacture and Identification
 - 3.5.1.1. Become familiar with section's electronic standard ammunition file (SAF), CartWinPro™. Practice using the CartWinPro™ program to search for headstamps at the direction of your Principal Instructor.

Principal Instructor Signature and Date

- 3.5.1.2. Discuss the range of bullet styles and weights based on the stock ammunition in the section's ammunition supply.

Principal Instructor Signature and Date

- 3.5.1.3. Know and discuss the different cartridge case and primer materials and how these materials can affect the markings imparted to the cartridge case during the firing process.



Principal Instructor Signature and Date

3.5.1.4. Refer to the AFTE Glossary and reloading manuals. Identify and define the following words and terms with regard to cartridge case nomenclature/ manufacturing.

- Cartridge case
- Headstamp
- Mouth
- Extractor groove
- Neck
- Flash hole
- Cannelure
- Head
- Bunter
- Web
- Shoulder
- Primer pocket
- Primer (types and sizes)

Principal Instructor Signature and Date

3.5.1.5. Identify, define and assemble a collection of representative bullets that best displays each of the following bullet types. Discuss the purpose and effect of each bullet design with your Principal Instructor.

- Full metal jacket
- Jacketed round nose
- Hollow point
- Copper coated lead
- Frangible
- Nickel plated
- Boattail
- Total metal jacket
- Semi-jacketed soft point
- Jacketed hollow point
- Brass coated lead
- Truncated nose
- Spitzer

Principal Instructor Signature and Date

3.5.1.6. Know and discuss the difference between caliber and caliber class. Illustrate this difference by relating these terms to a discussion of the .22 caliber, .30 caliber and .38 caliber families of cartridges.

Principal Instructor Signature and Date

3.5.1.7. Discuss what the NATO designation on cartridges indicates with your Principal Instructor. Prepare a list of cartridges that have a NATO designation.



Principal Instructor Signature and Date

3.5.1.8. Identify the meaning of a +P (and similar) designations on cartridges. What does “match grade” ammunition mean? Discuss these with your Principal Instructor.

Principal Instructor Signature and Date

3.5.1.9. Discuss different specific caliber designations that are similar to each other (e.g., 38 Auto vs 38 Super, 223 Remington vs 5.56x45mm) with your Principal Instructor. Include in your discussion how the cartridges are similar, how they are different, and the implications of using them interchangeably when test firing.

Principal Instructor Signature and Date

3.5.1.10. If possible, visit at least one ammunition manufacturing facility. Observe the manufacture of the various components and the final assembly of rimfire and centerfire cartridges and shotshells. Take detailed notes of the manufacturing processes and generate a written report. Completion of this exercise is not required to show competency as a NIBIN Technician.

Principal Instructor Signature and Date

3.6. Reading

3.6.1. Required Reading for Cartridge Manufacture and Identification

- *Book of Pistols and Revolvers by Smith*; pp. 23-25.
- *Cartridges for Collectors by Datig*; pp. 9 through 18.
- *Pistol and Revolver Cartridges, Vols. I and II, by White and Munhall; revised by Bearse*; pp. 1-13 in each volume.
- *Small Arms of the World, 9th or 10th Edition, by Smith*; pp. 43-47.
- *Centerfire Pistol and Revolver Cartridges, by White, Munhall and Bearse*; pp. 140-146.
- *Cartridges of the World 7th Edition, by Barnes*; Chapter 11; *8th Edition*, Chapter 12; *7th Edition*, Chapter 10.
- *Ammunition Making* by H. L. Peterson; NRA, 1990.



- Firearms Investigation, Identification, and Evidence by Hatcher, Jury, and Weller; Chapter 4 pp. 63-105.

Student Signature and Date of Reading Completion

3.6.2. Required Reading for Terminology Used in Cartridge Loading and Ballistics

- Lyman Reloaders Manual and Sierra Reloading Manual.
- Cartridges of the World 5th Edition by Barnes; Chapter 14.
- NRA Handloaders Guide, Chapters 1-8.
- Centerfire Pistol and Revolver Cartridges, by White, Munhall and Bearnse, Volume II, Chapter 1.
- NRA Handloaders Guide, Chapter 9.
- Cartridges of the World 7th Edition by Barnes; Chapter 10.

Student Signature and Date of Reading Completion

3.6.3. Review as necessary

- Military Small Arms Ammunition of the World by P. Labbett; 1945-1980; Presidio Press, 1980.

3.7. Terminology

Research the following terms using the AFTE Glossary and discuss each with your Principal Instructor. (If the term is not in the AFTE Glossary, consult with your Principal Instructor on how to research the term.):

3.7.1. Cartridge Manufacture and Identification

Ammunition	Boattail Bullet	Bottleneck Cartridge
Brass	Brass-Coated Lead Bullet	Bullet
Cannelure	Cartridge	Cartridge Case
Copper Coated Lead Bullet	Crimp	Extractor Groove
Head	Headstamp	Hollow-Point Bullet
Jacketed Bullet	Mouth	Neck
Ogive	Primer	Rebated Rim Cartridge
Rimmed Cartridge	Rimless Cartridge	Round-Nosed Bullet
Semi-Rimmed Cartridge	Shoulder	Silvertip Bullet
Soft Point Bullet	Spitzer Bullet	Tapered Cartridge
Truncated-Nosed Bullet	Wadcutter Bullet	Dram Equivalent
Gauge	High/Low Brass/Cup	Shot Collar



Shotshell

Wadding

Principal Instructor Signature and Date

3.7.2. Terminology Used in Cartridge Loading and Ballistics

Ammunition Color Code	Ammunition Lot	Ammunition, Ball
Ammunition, Match	Ammunition, Metallic	Brass Washed Bullet
Bullet, Armor Piercing	Bullet Casting	Bullet, Coated
Bullet, Copper Jacket	Bullet, Copper Washed	Bullet Core
Bullet Diameter	Bullet, Flat-Nosed	Bullet, Full Metal Case
Bullet, Full Metal Jacket	Bullet, Hollow Base	Bullet, Hollow Point
Bullet, Incendiary	Bullet Jacket	Bullet, Lead
Bullet, Plated	Bullet, Round Nose	Bullet, Semi-Jacketed Hollow Point
Bullet, Steel Jacketed	Bullet Puller	Caliber
Cartridge, Center Fire	Cartridge Designation	Cartridge, Magnum
Cartridge, Rimfire	Headspace	Grain
Load, Squib	Misfire	Necking Down
Pressure	Projectile	Reloading
Over Shot Wad	Paper Disc	Shot
Slug	Wad, Cup	Shot Carrier
Buffer	Wad, Filler	Wad, Base
Shot Cup	Shot Column	Shot Size

Principal Instructor Signature and Date

3.8. Estimated Training Time

88 hours total

3.8.1. Cartridge Manufacture and Identification (16 hours)

3.8.2. Terminology Used in Cartridge Loading and Ballistics (72 hours)



4. Evidence Handling, Biohazards, and Safety

4.1. Sections

- 4.1.1. Overview of Evidence Receiving and Transfer
- 4.1.2. Biohazard items
- 4.1.3. Laboratory Safety

4.2. Training Objectives

To instruct the student in the proper methods of handling, preserving, and marking of evidence.

4.3. Method of Evaluation

- 4.3.1. Written/practical **exercises**
- 4.3.2. Oral discussion

4.4. Training Methods

- 4.4.1. Self-directed study
- 4.4.2. **Observation**
- 4.4.3. Practical exercises
- 4.4.4. Discussion

4.5. Practical Exercises

4.5.1. Overview of Evidence Receiving and Transfer

- 4.5.1.1. The student shall be taken through the procedure of receiving evidence for NIBIN processing. Emphasis shall be placed on actions with evidence discrepancies, checking for an unloaded condition in submitted firearms, and handling evidence in unusual circumstances.

Principal Instructor Signature and Date

- 4.5.1.2. The student shall review all procedures pertaining to the marking of evidence and be given practical exercises in marking test fires.

Principal Instructor Signature and Date

4.5.2. Biohazard items

- 4.5.2.1. Review safety procedures for handling biohazardous substances with your Principal Instructor, including, but not limited to PPE and what to do in the event of an exposure.



Principal Instructor Signature and Date

4.5.2.2. Review procedures to be followed before an item marked as a biohazard is processed for NIBIN or casework with your Principal Instructor. **Develop a workflow for yourself on what to check/do before an item can be processed and review the workflow with your Principal Instructor. Demonstrate your knowledge of this process by completing all the checks/steps prior to processing on at least 10 requests that include biohazard firearm(s) and/or fired cartridge case(s). The requests must include at least one item that has been swabbed and one item that has not been swabbed already.**

Principal Instructor Signature and Date

4.5.2.3. Review procedures for decontaminating, **preserving, and repackaging** (potentially) biohazardous items with your Principal Instructor. **Your review must include procedures for decontaminating firearms, magazines, and fired cartridge cases. Demonstrate your ability to properly decontaminate at least 5 firearms and magazines by decontaminating the surface, as well as at least 5 firearms and magazines that require field stripping the items. Demonstrate your ability to properly document the decontamination of these items.**

Principal Instructor Signature and Date

4.5.3. Laboratory Safety

4.5.3.1. Review general laboratory safety policies and procedures with your Principal Instructor. Include, but do not limit the discussion to, PPE, chemical safety, what to do in the event of chemical exposure, chemical spill, medical emergency, or a fire.

Principal Instructor Signature and Date

4.6. Reading

4.6.1. Required reading

- HFSC Quality Manual
- Firearms Section Standard Operating Procedures



- HFSC Health and Safety Manual
- All reading listed by TFSC as required for the Evidence Handling of the Technician License Exam.

Student Signature and Date of Reading Completion

4.7. Terminology

None

4.8. Estimated Training Time

40 hours



5. Function Testing, Test Firing, and Specimen Recovery

5.1. Sections

- 5.1.1. Test Firing Safety
- 5.1.2. Selecting Ammunition for Test Firing
- 5.1.3. Test Firing and Bullet Recovery Methods
- 5.1.4. Function Testing Firearms (Mock Cases)
- 5.1.5. Competency

5.2. Training Objectives

To instruct the student in the proper methods of range safety procedures, basic firearm repair, preparing firearms for test firing, ammunition selection for test firing, test firing, bullet recovery devices, special equipment for firing unsafe weapons, and firearm terminology. The student will demonstrate competency in function-testing and test firing firearms for the NIBIN program. All mock casework and competency tests are completed utilizing the normal workflow for NIBIN Only requests, including having 2 reviewers. All mock casework is also reviewed by the principal instructor.

5.3. Method of Evaluation

- 5.3.1. Discussion
- 5.3.2. Written/practical exercises
- 5.3.3. Written quiz
- 5.3.4. Competency test(s)

5.4. Training Methods

- 5.4.1. Self-directed study
- 5.4.2. Discussion
- 5.4.3. Observation

5.5. Practical Exercises

- 5.5.1. Test Firing Safety
 - 5.5.1.1. Review the test firing safety rules, cite the rules and explain the reason for each rule with your Principal Instructor. Include, but do not limit the review to, PPE (both required and optional), verbal and visual cues used when firing, and safe directions in the designated shooting area.

Principal Instructor Signature and Date

5.5.2. Selecting Ammunition for Test Firing



5.5.2.1. Familiarize yourself with the ammunition storage areas in the section. Know how to locate test ammunition. Discuss with your Principal Instructor the reasons for using substitute ammunition for test firing.

Principal Instructor Signature and Date

5.5.3. Test Firing and Bullet Recovery Methods

5.5.3.1. Become knowledgeable about the capabilities and limitations in the section for test firing and recovery of fired test bullets. Know when and how to use the each option. Observe and assist your Principal Instructor in the recovery of fired bullets using any available methods. Know and observe all safety rules.

Principal Instructor Signature and Date

5.5.3.2. Review with your principal instructor how to set up a firearm to be fired using any remote firing devices available for use. Demonstrate your ability to the satisfaction of your principal instructor. Discuss when it would be appropriate to use the remote firing device.

Principal Instructor Signature and Date

5.5.3.3. Discuss reasons you would not fire a firearm with your principle instructor. Include, but do not limit your discussion to the condition of the firearm, ammunition, shooting tank, and shooting range.

Principal Instructor Signature and Date

5.5.3.4. Recover bullets fired from handguns and rifles into the shooting tank utilized by the Firearm Section.

Principal Instructor Signature and Date

5.5.3.5. Practice marking bullets and cartridge cases with both a forensic case number and item number. The firearms section marks bullets and cartridge cases by engraving. There are two types of engravers available to use: powered and manual. You may



use either or both kinds, but your engraving must be consistently legible (you may need to use a magnifying tool or stereoscope). Practice engraving as many bullets and cartridge cases as needed until your primary trainer is satisfied you can do so reliably.

Principal Instructor Signature and Date

5.5.4. Function Testing Firearms (Mock Cases)

5.5.4.1. Perform function tests (under the direct supervision of a trained analyst) on at least **20** pistols and record the work performed **in LIMS**. Firearms tested should be a variety of firearms that are representative of pistols routinely seen in NIBIN work and should include, if possible, an automatic pistol. More than **20** pistols may be assigned to the student at the discretion of the Section Manager or primary trainer.

Principal Instructor Signature and Date

5.5.4.2. Test fire at least **20** pistols (under the direct supervision of a trained analyst) and record the **results in LIMS**. **Collect, engrave and retain these test fires for future training activities**. Firearms tested should be a variety of firearms that are representative of pistols routinely seen in NIBIN work and should include, if possible, an automatic pistol. More than **20** pistols may be assigned to the student at the discretion of the Section Manager or primary trainer.

Principal Instructor Signature and Date

5.5.4.3. Perform function tests (under the direct supervision of a trained analyst) on at least **10** rifles and record the work performed **in LIMS**. Firearms tested should be a variety of firearms that are representative of rifles routinely seen in NIBIN work and should include, if possible, a rifle that can fire in either automatic or 3-round burst mode. **At least one rifle should include a tube magazine**. More than **10** rifles may be assigned to the student at the discretion of the Section Manager or primary trainer.

Principal Instructor Signature and Date

5.5.4.4. Test fire at least **10** rifles (under the direct supervision of a trained analyst) and record the **results in LIMS**. **Collect, engrave and retain these test fires for future**



training activities. Firearms tested should be a variety of firearms that are representative of rifles routinely seen in NIBIN work and should include, if possible, a rifle that can fire in either automatic or 3-round burst mode **and a rifle with a tube magazine.** More than **10** rifles may be assigned to the student at the discretion of the Section Manager or primary trainer.

Principal Instructor Signature and Date

5.5.4.5. Perform function tests (under the direct supervision of a trained analyst) on at least **10** shotguns and record the work performed **in LIMS.** Firearms tested should be a variety of firearms that are representative of shotguns routinely seen in NIBIN work and shall include semiautomatic and pump action shotguns. More than **10** shotguns may be assigned to the student at the discretion of the Section Manager or primary trainer.

Principal Instructor Signature and Date

5.5.4.6. Test fire at least **10** shotguns (under the direct supervision of a trained analyst) and record the **results in LIMS. Collect, engrave and retain these test fires for future training activities.** Firearms tested should be a variety of firearms that are representative of shotguns routinely seen in NIBIN work and shall include semiautomatic and pump action shotguns. More than **10** shotguns may be assigned to the student at the discretion of the Section Manager or primary trainer.

Principal Instructor Signature and Date

5.5.5. Competency

5.5.5.1. **Competency in function testing and test firing any or all types of firearms requires that the trainee has completed the relevant portions of this Unit, as well as Units 1, 2, 3, 4 and 6. Students may show competency in one or more types of firearms, but must show competence before being authorized to do independent work on that firearm type.**

5.5.5.2. **For each section/type of firearm, the trainer will choose the firearms and create a "key" of all expected answers to appear in function testing examination documentation. The trainer will observe the trainee as they test fire each firearm function tested, demonstrating safe firearm handling, appropriate ammunition**



selection, and test firing procedures. How the firearm functioned during test firing must be accurately documented.

- 5.5.5.3. Chain of custody, examination documentation, and NIBIN Notifications must be generated for each firearm tested. Each test fire must be collected, engraved, and retained for future training activities. Successful completion means the trainee engraves each test fire legibly, completes the examination documentation with no technical errors with a high or moderate impact (as defined by section guidelines). A maximum of one technical error with low impact may be made per firearm tested. Technical errors include examination documentation that does not conform to the expected answers in the answer key. A maximum 2 administrative errors per firearm tested are allowed.
- 5.5.5.4. If a trainee does not successfully complete the competency, he/she must re-do the competency with the same (or similar) firearms. If the trainee does not successfully complete a competency on the second attempt, the trainer will evaluate the area(s) of concern and assign appropriate practical exercise for the trainee to complete before he/she attempts the competency again.
- 5.5.5.5. Number of firearms required to demonstrate competency in function testing and test firing:
 - 5.5.5.5.1. At least 5 pistols selected from the list in section 2.5.3.1. At least one handgun must be treated as a biohazard. Demonstrate familiarity with HFSC and Firearms Section policies and procedures when handling biohazard items. More than 5 pistols may be assigned to the student at the discretion of the Section Manager or primary trainer.
 - 5.5.5.5.2. At least 5 rifles selected from the list in section 2.5.4.1. At least one rifle must have a tube magazine. At least one rifle must be treated as a biohazard. Demonstrate familiarity with HFSC and Firearms Section policies and procedures when handling biohazard items. More than 5 rifles may be assigned to the student at the discretion of the Section Manager or primary trainer.
 - 5.5.5.5.3. At least 3 shotguns selected from the list in section 2.5.5.1. More than 3 shotguns may be assigned to the student at the discretion of the Section Manager or primary trainer.

5.6. Reading

5.6.1. Required Reading

- *Textbook of Firearms Investigation, Identification and Evidence* by Hatcher, Jury and Weller; (Pennsylvania: Stackpole company, 1957) pp. 235-239, Chapter 1.
- *Hatcher's Notebook* by Hatcher; (Pennsylvania: Stackpole Company, 1962), Chapters 7, 8, 12, 29, and 35.



- Problems and Advantages of Test Firing Weapons into Water, Journal of The Forensic Science Society, Vol. 6, No. 2, April 1966.
- Horizontal Water Recovery Tank by J.C. Cayton; AFTE Journal; Vol. 6, No. 1 (February 1974) pp. 23-24.
- Water Penetration Test, by L.R. Harden; AFTE Newsletter; Vol. 3, No. NL14 (June 1971) pp. 12-15.
- Firing Chamber and Safety Measures Taken in the Firearm and Toolmark Work Environment, by John Cayton; AFTE Journal; Vol. 17, No. 3 (July 1985), pp. 95-99.
- Firearms Safety in the Laboratory, by Gerard Dutton; AFTE Journal; Vol. 29, No. 1 (Winter 1997) pp. 37-41.
- The Identification of Firearms by Gunther & Gunther; (New York: John Wiley and Sons, 1935), p. 55.
- NRA Guide to Firearms Assembly, Vol. 3, 221.
- NRA Guide to Firearms Assembly, pp.117 and 239.

Student Signature and Date of Reading Completion

5.7. Terminology

Research the following terms using the AFTE Glossary and discuss each with your Principal Instructor. (If the term is not in the AFTE Glossary, consult with your Principal Instructor on how to research the term.):

Bullet Recovery System	Bullet Splash	Backstop
Cotton Box	Face Shield	Full Auto
Function Testing	Test Fire	Tubular Magazine
Vise	Water Tank	

Principal Instructor Signature and Date

5.8. Estimated Training Time

100 hours



6. LIMS and Notification Writing

6.1. Sections

- 6.1.1. Overview of the Laboratory Information Management System (LIMS)
- 6.1.2. Examination documentation
- 6.1.3. Writing notifications

6.2. Training Objective

To instruct the student in the use of LIMS. The student will also gain experience in writing notifications.

6.3. Method of Evaluation

Written/practical exercises

6.4. Training Method

- 6.4.1. Self-directed study
- 6.4.2. Observation
- 6.4.3. Practical exercises
- 6.4.4. Discussion

6.5. Practical Exercises

6.5.1. Overview of the Laboratory Information Management System (LIMS)

6.5.1.1. The student shall be shown the procedure for creating an assignment in portal and LIMS and associating evidence items with the assignment. The student shall be shown how to create items and sub-items of evidence. The student is shown how to do proper chain of custody transactions in LIMS. The student is shown how to add attachments, comm log, and case events in LIMS. The student is shown how to create items of evidence in EMS. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.5.1.2. The student is show how to complete a review DUI in LIMS for a request, and how to view a review DUI report. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date



6.5.1.3. The student should be shown how to query LIMS and/or Dashboards for the following: completed and pending requests assigned to him/her, evidence in his/her custody, common reports, and methods for searching the database for information. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.5.1.4. The student shall be taken through the procedure for querying LIMS, portal, and EMS for case/evidence information. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.5.2. Examination Documentation (student only needs to examination documentation for the areas of competency they will be trained in.)

6.5.2.1. The student will be shown how to complete the appropriate fields in LIMS associated with NIBIN Only requests for function testing and test firing firearms. The student will be shown how to create appropriate worksheets in LIMS. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.5.2.2. The student will be shown how to complete the appropriate fields in LIMS associated with NIBIN Only requests for evaluating fired evidence cartridge cases for NIBIN entry. The student will be shown how to create appropriate worksheets in LIMS. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.5.3. Writing (student only needs to do notifications for the areas of competency they will be trained in.)

6.5.3.1. The student will be shown how to properly create a notification for a NIBIN Only request addressing the function testing and test firing of a firearm for NIBIN



processing in LIMS. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.5.3.2. The student will be shown how to properly create a notification for a NIBIN Only request addressing evaluation of fired evidence cartridge cases for NIBIN processing in LIMS. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.5.3.3. The student will be shown how to properly create a notification for a NIBIN Lead in LIMS. Demonstrate your ability to perform these tasks to the satisfaction of your Principal Instructor.

Principal Instructor Signature and Date

6.6. Reading

- LIMS Training Manual (Current Edition)
- Firearms Section Standard Operating Procedures

Student Signature and Date of Reading Completion

6.7. Terminology

None

6.8. Estimated Training Time

40 hours



7. Instrumentation

7.1. Sections

None

7.2. Training Objectives

To instruct the student in the operation and maintenance of the instruments used in the Firearms Section and continue development of his/her knowledge of firearm terminology.

7.3. Method of Evaluation

7.3.1. Practical **exercises**

7.3.2. **Discussion**

7.4. Training Methods

7.4.1. Self-directed study

7.4.2. **Observation**

7.4.3. Discussion

7.5. Practical Exercises

7.5.1. Differentiate between the following:

- Compound microscope
- Stereo microscope
- Comparison microscope

Principal Instructor Signature and Date

7.5.2. Familiarize yourself with the mechanical and optical aspects of the comparison microscopes and stereo microscope in the Firearms Section. Your Principal Instructor will review these with you.

Principal Instructor Signature and Date

7.5.3. Examine at least 20 sets of fired cartridge cases using a comparison microscope. Adjust the light sources with respect to angle and vary the intensity of the light source, if possible. Discuss this with your Principal Instructor.



Principal Instructor Signature and Date

7.5.4. Become familiar with and demonstrate the use of an inertia bullet puller.

Principal Instructor Signature and Date

7.6. Reading

7.6.1. Required Reading

- The Stereomicroscope Instrumentation and Techniques, by Schlueter & Gumpertz; American Laboratory, April 1976
- Manufacturer’s Procedure and Operation Manuals
- The Microscope A Practical Guide, by G. H. Needham
- Firearms Identification, by Mathews; (Wisconsin: University Wisconsin Press, 1962), Vol. 1, Chapter 4.
- Firearms Investigation Identification and Evidence, by Hatcher, Jury and Weller; (Pennsylvania: The Stackpole Company, 1957); Chapter 10.
- Basic Optics by Claude Cook; AFTE Journal; Vol. 17, No. 4 (October 1985) pp. 24-29 and 38-52.

Student Signature and Date of Reading Completion

7.7. Terminology

Research the following terms using the AFTE Glossary and discuss each with your Principal Instructor. (If the term is not in the AFTE Glossary, consult with your Principal Instructor on how to research the term.):

Binocular Microscope	Calibration	Comparison Microscope
Compound Microscope	Inertia Bullet Puller	Magnification
Mounting Stage	Objective	Oblique Angle
Ocular lens	Scales (Grain/Gram)	Stereo Microscope

Principal Instructor Signature and Date



7.8. Estimated Training Time

40 hours



8. Test Fire and Evidence Cartridge Case Examination and Comparison

8.1. Sections

- 8.1.1. Class Characteristics
- 8.1.2. Subclass Characteristics
- 8.1.3. Individual Characteristics
- 8.1.4. Competency

8.2. Training Objectives

To instruct the student in the methods used in the **evaluation** of cartridge **cases for suitability for NIBIN entry**.

8.3. Method of Evaluation

- 8.3.1. Discussion
- 8.3.2. Practical exercises
- 8.3.3. Competency test(s)

8.4. Training Methods

- 8.4.1. Self-directed study
- 8.4.2. Discussion
- 8.4.3. Observation
- 8.4.4. Practical exercises

8.5. Practical Exercises

8.5.1. Class Characteristics

- 8.5.1.1. Review the section(s) of the Standard Operating Procedures covering the examination fired cartridge cases. Discuss with your Principal Instructor.

Principal Instructor Signature and Date

- 8.5.1.2. Describe "class characteristics" as the phrase applies to markings on a fired cartridge case. Determine the types of marks that can be left on a cartridge case/cartridge during loading/extracting and firing. Review media (if available) regarding the slow motion of firing sequences using semiautomatic firearms.

Principal Instructor Signature and Date



8.5.1.3. Using test cartridge cases, relate the markings imparted to the fired cartridge cases with the parts on the firearm which produced these markings. Note: Your Principal Instructor will provide the test fired casings and will conduct these examinations with you.

Principal Instructor Signature and Date

8.5.2. Subclass Characteristics

8.5.2.1. Define subclass characteristics and discuss their implications in evaluating cartridge cases for NIBIN entry.

Principal Instructor Signature and Date

8.5.3. Individual Characteristics (Test Fires)

8.5.3.1. Using the test fired cartridge cases created during completion of sections 5.5.4.2, 5.5.4.4, and 5.5.4.6, microscopically inter-compare the markings on each set of test fires with each other. **If the student does not have the sets of test fires referenced above, the trainer may provide test fires from 20 pistols, 10 rifles, and 10 shotguns.**

8.5.3.1.1. Include the following types of markings in your microscopic comparisons:

- Firing pin impression
- Breechface marks
- Extractor marks
- Ejector marks

8.5.3.1.2. Describe “individual characteristics” as the phrase applies to markings on a fired cartridge case.

8.5.3.1.3. For each set of test fires, identify the item or items you would select for NIBIN imaging. **Depending on the markings, it may be necessary to select more than one representative item.** Be prepared to discuss your choices with your Principal Instructor. Include in your discussion any items you would not image and why.

Principal Instructor Signature and Date

8.5.4. Individual Characteristics (Fired Evidence Cartridge Cases)

The trainee must have already completed the exercises above in section 8.5.3 prior to proceeding with this section.



8.5.4.1. Your principal instructor will select test fires from firearms commonly seen for NIBIN processing. Any set of test fires selected must have at least two accompanying set of test fires of the same class and have similar types of marks (e.g., the trainee must be provided with test fires from at least 3 Glock-type firearms). The trainer will provide groups of test fired samples from the following types of firearms (the manufacturers in parenthesis are examples to provide guidance to the trainer in test fire selection, the samples do not have to be from that type of firearm):

- Elliptical firing pin with shear (Glock)
- Heavy parallel marks (Hi-point)
- Smooth or gross marks on breechface (Jimenez/Jennings/Bryco/Lorcin)
- Granular breechface with or without arches (Beretta)
- Teardrop shape firing pin orifice with shear (M&P)
- Fine parallel markings on breechface, usually with a drag and sometimes shear (Colt, Taurus)
- Circular marks on a breechface resulting from a rotating bolt (7.62x39mm and 223 Rem/5.56 caliber firearms should be represented)
- 22 Rim fire (Rectangular and circular should be represented)
- Smooth marking breechface (Shotguns)

8.5.4.2. Evaluate each test fire grouping for individual characteristics and identify which items you would select for NIBIN imaging. Your goal is to identify one cartridge case from each firearm represented. Depending on the markings, it may be necessary to select more than one representative item for each firearm. Be prepared to discuss your choices with your principal instructor.

8.5.4.3. For each grouping of cartridge cases you evaluate, complete the appropriate examination documentation and issue a NIBIN Only Notification. Your trainer will review your examination documentation and notifications and provide feedback.

Principal Instructor Signature and Date

8.5.5. Competency

8.5.5.1. Competency in evaluating test fired cartridge cases for NIBIN entry requires the trainee has completed Unit 1, 7 and the relevant portions of this Unit. The student must evaluate the test fires created during completion of sections 5.5.5.5.1-5.5.5.5.3 and select representative items for imaging. If the student does not have the sets of test fires referenced above, the trainer may provide test fires from 5 pistols, 5 rifles, and 3 shotguns.



- 8.5.5.1.1. The trainer will pre-select any items he/she would not choose for NIBIN imaging. The trainer must be able to identify the items that would be inappropriate for imaging without indicating them to the trainee.
 - 8.5.5.1.2. The trainee then selects which items he/she would choose for NIBIN imaging.
 - 8.5.5.1.3. If the trainee selects one of the items the trainer has pre-selected as not appropriate for imaging (or if the trainee selects more than one item for imaging), the trainee must provide the trainer with specific, sound reasons why (this may be provided in writing or orally). If the trainer is satisfied with the reasoning, the selection is considered satisfactory. If the trainer is not satisfied with the reasoning, or none is given, the selection is considered unsatisfactory.
 - 8.5.5.1.4. The trainee may not have more than one set of test fires with an unsatisfactory choice. If more than one evaluation is considered unsatisfactory, the trainee must repeat the competency. If the trainee does not successfully complete a competency on the second attempt, the trainer will evaluate the area(s) of concern and assign appropriate practical exercise for the trainee to complete before he/she attempts the competency again.
- 8.5.5.2. Competency in evaluating fired evidence cartridge cases for NIBIN entry requires the trainee to have completed Units 1, 4, 6, 7, and this Unit. The student must complete 5 mock cases. Each mock case should contain multiple cartridges cases from between 1 and 4 firearms of the same/similar class that mark similarly. At least one mock case must be treated as a biohazard.
- 8.5.5.2.1. The trainer will pre-select any items he/she would not choose for NIBIN imaging. The trainer must be able to identify the items that would be inappropriate for imaging without indicating them to the trainee.
 - 8.5.5.2.2. Chain of custody, examination documentation, and NIBIN Notifications must be generated for each mock case. Successful completion means the trainee selects a cartridge case from each firearm represented within the case without missing any firearms represented. The trainee must also not select any items for imaging that the trainer pre-selected as inappropriate (or he/she must be able to provide satisfactory reasoning for their choice (see 8.5.5.1.3)). No technical errors with a high or moderate impact (as defined by section guidelines) may be made. A maximum of one technical error with low impact may be made per mock case, and a maximum 2 administrative errors per mock case are allowed.
 - 8.5.5.2.3. If the above criteria are not met, the student must repeat the competency. If the student does not successfully complete a competency on the second attempt, the trainer will evaluate the area(s) of concern and assign appropriate practical exercise for the trainee to complete before he/she attempts the competency again.



8.6. Reading

8.6.1. Required Reading

- Firearms Identification, by Mathews; (Wisconsin: University Wisconsin Press, 1962); Vol. 1, Part. 1, Chapters 3 and 6.
- Firearms Investigation, Identification and Evidence, by Hatcher, Jury and Weller; (Pennsylvania: The Stackpole Company, 1957); pp. 285-304 and Chapters 12, 13, and 14.
- Introduction to Tool Marks, Firearms and the Striagraph, by Davis; (Illinois: Charles C. Thomas, 1958); Chapter 5.
- Identification of Firearms and Forensic Ballistics, by Burrard; (New York: A. S. Barnes and Co., 1962); Chapters 6, 8, and 9.
- The Identification of Firearms, by Gunther and Gunther; (New York: John Wiley & Sons, 1935); Chapter 1 pp. 13-102.
- Hatcher's Notebook, by Hatcher; (Pennsylvania: The Stackpole Company, 1957); Part 1, Chapter 35, and pp. 431-441.
- Scientific Evidence in Criminal Cases, by Moenssens and Inbau; (New York: The Foundation Press, 1978); Chapter 4 pp. 180-182.
- Forensic Science Handbook Vol. II, by Saferstein; (New Jersey: Prentice Hall, 1988); Chapter 8 pp. 430-434.
- AFTE Journal Index, by Terry LaVoy; (Tampa: TA LaVoy & Associates, 1999); Cartridge Case Section.

Student Signature and Date of Reading Completion

8.6.2. Recommended Reading

- AFTE Glossary, current version (terms as needed).

8.7. Terminology

None

8.8. Estimated Training Time

280 hours



9. NIBIN Acquisition and Correlation Review

9.1. Sections

- 9.1.1. NIBIN Acquisition
- 9.1.2. Correlation Review

9.2. Training Objective

To instruct the student in the use of the section's ballistic imaging program.

9.3. Method of Evaluation

- 9.3.1. Discussion
- 9.3.2. Practical exercises
- 9.3.3. Competency

9.4. Training Methods

- 9.4.1. Self-directed study
- 9.4.2. Discussion
- 9.4.3. Observation
- 9.4.4. Practical exercises
- 9.4.5. ATF approved authorized training

9.5. Practical Exercises

9.5.1. NIBIN Acquisition

- 9.5.1.1. The student will explain what NIBIN, IBIS, and BrassTrax are and how they are related to the satisfaction of the Principal Instructor.

Principal Instructor Signature and Date

- 9.5.1.2. Read the ATF Minimum Required Operating Standards for National Integrated Ballistic Information Network (NIBIN) Sites (MROS). Review this document with your Principle Instructor and discuss the implications of the requirements for HFSC and for you as an analyst in the Firearms Section.

Principal Instructor Signature and Date

9.5.2. Correlation Review



9.5.2.1. Review the meaning of class, subclass, and individual characteristics. Discuss their meaning and importance in the context of issuing NIBIN leads with your Principal Instructor.

Principal Instructor Signature and Date

9.5.2.2. Discuss with your principal instructor the definitions of high confidence and low confidence leads. Include, but do not limit your discussion to the implications of each type for law enforcement investigations.

Principal Instructor Signature and Date

9.5.2.3. Discuss the difference between a NIBIN Lead and a NIBIN Hit with your principal instructor. Include in your conversation how the terms are frequently used interchangeably and the confusion surrounding this.

Principal Instructor Signature and Date

9.5.2.4. Your principal instructor will assign you to review at least 25 pre-screened correlations. Within this set of 25, there will be correlations containing known leads of varying ranks/scores and difficulty, as well as correlations that do not have leads. Your instructor will know the “answers” without indicating them to you. Your goal is to successfully identify any leads present while not identifying something as a lead when it is not. Depending on the strength of the lead, you may identify some as low confidence. You will practice issuing NIBIN Lead Notifications for any leads you identify. Your trainer will provide feedback on any missed leads, as any mis-identified leads, and your Notifications. This should be discussed in-depth with your principal instructor.

Principal Instructor Signature and Date

9.5.3. Competency

9.5.3.1. NIBIN Acquisition

NIBIN acquisition requires the trainee has completed Unit 1, 7 and the relevant portions of this Unit. The trainee must have also successfully completed an ATF approved NIBIN acquisition training program.



9.5.3.1.1. The trainee must complete at least 50 acquisitions and have them reviewed by the Principal Instructor for conformance to training standards. Successful completion means that the student acquires entries with no more than 10% of the entries with a defect that impacts the correlation (caliber, firing pin shape, ring placement, occurrence and collection dates, forensic and agency case numbers and exhibit number). No more than 15% of the entries may have a defect that does not impact the correlation (firearm information, reception date, event type, cartridge make, cartridge composition (if entered), breechface characteristics (if entered)).

9.5.3.1.2. If the trainee does not successfully reach the above defect rate, he/she will continue making acquisitions with feedback from the principal instructor. The trainee will continue to complete acquisitions in batches of 20 until a satisfactory defect rate is obtained (considering all acquisitions made). Once a satisfactory defect rate is obtained, the trainee will repeat the competency as outlined in 9.5.3.1.1, but with 20 acquisitions instead of 50.

9.5.3.2. Correlation Review

NIBIN Correlation review requires the trainee has completed this Unit, Units 1, 7 and 8 as well as the relevant portions of Unit 6. The trainee must have also successfully completed an ATF approved NIBIN Correlation Review training program.

9.5.3.2.1. The trainee must review at least 50 correlations that are subsequently reviewed by an analyst authorized to perform correlation reviews. Within the correlations reviewed, 5% must have leads (as identified by the reviewing analyst(s)). This rate is consistent with section averages. While this is beyond the trainee's control, the trainee must continue to review correlations until the lead rate reaches at least 5% of the total number of correlations reviewed.

9.5.3.2.2. Successful completion means that the trainee finds all high confidence leads and does not mis-identify any leads as high confidence. A trainee may not miss more than 2% of low confidence leads (1 per 50), call more than 2% of leads low confidence when they are high confidence, or call more than 2% of leads as low confidence when they are not leads (2% in each category would be considered satisfactory, but over 2% in any category would be considered unsatisfactory). A trainee must provide justification for any low confidence lead to the reviewing analyst. The reviewing analyst will document they received justification.

9.5.3.2.3. Successful completion also requires issuing NIBIN Lead Notifications. The trainee will generate NIBIN Lead Notifications in a LIMS training case (or training LIMS) that will correspond to the NIBIN Leads that are generated for all leads identified. This includes any low confidence leads and any lead notifications that require a corresponding reprint. The trainee should not have



access to the actual notifications generated. No technical errors with a high or moderate impact (as defined by section guidelines) may be made. A maximum of one technical error with low impact may be made per request, and a maximum 2 administrative errors per request are allowed.

9.5.3.2.4. If the trainee does not successfully complete the requirements of 9.5.3.2.2, he/she will repeat the competency. If the student does not successfully complete the competency on the second attempt, the trainer will evaluate the area(s) of concern and assign appropriate practical exercises for the trainee to complete before he/she attempts the competency again.

9.5.3.2.5. If the trainee does not successfully complete the requirements of 9.5.3.2.3 but is successful in 9.5.3.2.2, he/she will continue issuing NIBIN Lead Notifications in batches of at least 10 notifications until the requirements are met. (Reprints do not count towards the 10). (These can either be mock leads assigned by the trainer or notifications based on real leads but entered into a training case.) Once the trainee has met the requirements as outlined in 9.5.3.2.3, he/she will issue 5 lead notifications and meet the requirements as a final competency.

9.6. Required Reading

- NIBIN/IBIS training materials issued by Forensic Technology, Inc. (current edition).
- ATF Minimum Required Operating Standards for National Integrated Ballistic Information Network (NIBIN) Sites (current version)
- HFSC Firearms Section Standard Operating Procedures.
- ATF Policy on Issuing NIBN Leads

Student Signature and Date of Reading Completion

9.7. Terminology

9.7.1. Common Acronyms

NIBIN	National Integrated Ballistic Information Network
IBIS	Integrated Ballistics Identification System
BATF/BATF/BATFE	Bureau of Alcohol, Tobacco, Firearms, and Explosives

9.7.2. Define the following terms as they apply to NIBIN

Correlation	NIBIN Lead	NIBIN Hit
IBIS	Brasstrax	Matchpoint
Submit	Synchronize	



Principal Instructor Signature and Date

9.8. Estimated Training Time

120 hours



10. Testimony Training and Oral Exam

10.1. Sections

- 10.1.1. General Aspects of Forensic Science
- 10.1.2. Courtroom Procedure, Brady, and Michael Morton
- 10.1.3. Human Factors
- 10.1.4. Root Cause Analysis
- 10.1.5. Oral Exam
- 10.1.6. Mock Trial

10.2. Training Objective

To familiarize the student with basic court procedures, the application of law to forensic science, general aspects of forensic science, and evaluate the student's ability to communicate these ideas in a courtroom setting.

10.3. Method of Evaluation

- 10.3.1. Oral exam
- 10.3.2. Mock Trial – if needed

10.4. Training Methods

- 10.4.1. Self-directed study
- 10.4.2. Discussion (as needed)

10.5. Practical Exercise

- 10.5.1. The student will be given an oral examination by Section management. The oral exam is designed to evaluate the student's ability to communicate effectively in a courtroom setting as well as evaluate the student's fundamental knowledge needed to carry out day-to-day job duties. The oral examination questions may cover any aspect of this training manual. **More than one oral examination may be required. Further details on successful completion of the oral exam can be found in the Introduction of this training manual.**
- 10.5.2. **(As needed)** Due to limitations in licensing, NIBIN Technicians are not expected to testify in court. However, in the event a NIBIN Technician is called to testify, he/she will undergo a mock trial proceeding. The mock trial should cover all aspects the Technician may testify to, including accreditation, licensing, chain of custody, evidence integrity, and basic NIBIN imaging information.

Section Manager Signature and Date

10.6. Reading



10.6.1. Required Reading (General Aspects of Forensic Science)

- Houck, M., Siegel, J., Fundamentals of Forensic Science, 2nd edition or newer. Section I, Chapters 1 (Introduction), 2 (Crime Scene Investigation), and 3 (The Nature of Evidence).
- Saferstein, R. Criminalistics: An Introduction to Forensic Science, 8th edition or newer. Chapters 1 (Introduction), 2 (The Crime Scene), and 3 (Physical Evidence).

Student Signature and Date of Reading Completion

10.6.2. Required Reading (Courtroom Procedure, Brady, and Michael Morton)

- Houck, M., Siegel, J., Fundamentals of Forensic Science, 2nd edition (or more recent)., Chapter 23 (Legal Aspects of Forensic Science).
- All reading listed by the Texas Forensic Science Commission (TFSC) as required for the Brady and Michael Morton Act Domain of the Forensic Technician License Exam.

Student Signature and Date of Reading Completion

10.6.3. Required Reading (Human Factors)

- All reading listed by TFSC as required for the Human Factors Domain of the Forensic Technician License Exam.

Student Signature and Date of Reading Completion

10.6.4. Required Reading (Root Cause Analysis)

- All reading listed by TFSC as required for the Root Cause Analysis Domain of the Forensic Analyst License Exam.

Student Signature and Date of Reading Completion

10.6.5. Review as Needed

- All other required reading in this training manual

10.6.6. Recommended Reading (Expert Testimony)

- All reading listed by TFSC as required for the Expert Testimony Domain of the Forensic Analyst License Exam.

10.6.7. Recommended Reading (Statistics)



- All reading listed by TFSC as required for the Statistics Domain of the Forensic Analyst License Exam.

10.7. Estimated Training Time

80 hours



11. NIBIN Only and NIBIN Lead Notification Reviews

11.1. Training Objectives

A NIBIN Technician must be authorized to do independent casework as a primary for some period of time before demonstrating competency as a reviewer. In the HFSC firearms section, there are two rounds of review that both cover administrative and technical aspects. The amount of time will depend on the analyst's level of previous experience as well as his/her own confidence in performing reviews.

11.2. Method of Evaluation

- Discussion
- Written exercises
- Practice reviews
- Competency

11.3. Training Methods

- Mock cases
- Practice reviews

11.4. Practical Exercises

11.4.1. General Review

11.4.1.1. Review the Quality Manual sections on technical records, technical reviews, and administrative review. Review the Firearms Section SOPs regarding technical and administrative reviews. Review any guidelines developed by the section regarding conducting reviews. Prepare a detailed outline including what you think needs to be reviewed in a typical firearms comparison case. Discuss this outline with your Principal Instructor.

Principal Instructor Signature and Date

11.4.1.2. Your Principal Instructor will demonstrate how to complete review DUIs in Justice Trax and review the guidelines for the defect type, location, and category of the defect. Demonstrate your ability to properly complete these fields by filling in review DUIs with information as provided by your Principal Instructor.

Principal Instructor Signature and Date

11.4.2. NIBIN Only Notification Reviews



11.4.2.1. Firearms Processing

Practice reviewing real casework by completing at least 35 review DUIs as “training” in Justice Trax. The cases you review should not have already gone through either round of review. Once you have completed your practice review, discuss any defects you failed to identify or improperly identified with the reviewer that will complete the first round of review. The case should then be provided back to the primary for corrections (or to a second reviewer if it is defect free). Continue reviewing the case until the primary, you, the first reviewer, and the final reviewer are ready to release the report.

Principal Instructor Signature and Date

11.4.2.2. Fired Evidence Processing

Practice reviewing real casework by completing at least 15 review DUIs as “training” in Justice Trax. The cases you review should not have already gone through either round of review. Once you have completed your practice review, discuss any defects you failed to identify or improperly identified with the reviewer that will complete the first round of review. The case should then be provided back to the primary for corrections (or to a second reviewer if it is defect free). Continue reviewing the case until the primary, you, the first reviewer, and the final reviewer are ready to release the report.

Principal Instructor Signature and Date

11.4.3. NIBIN Lead Notification Reviews

Practice reviewing real casework by completing at least 25 review DUIs as “training” in Justice Trax. The cases you review should not have already gone through either round of review. Once you have completed your practice review, discuss any defects you failed to identify or improperly identified with the reviewer that will complete the first round of review. The case should then be provided back to the primary for corrections (or to a second reviewer if it is defect free). Continue reviewing the case until the primary, you, the first reviewer, and the final reviewer are ready to release the report.

Principal Instructor Signature and Date

11.4.4. Competency



11.4.4.1. NIBIN Only Notifications (Firearms Processing)

Competency as a NIBIN Only reviewer of firearms processing requests requires that the trainee is currently authorized to conduct independent casework in NIBIN processing of firearms. The student must complete 5 mock cases as a reviewer. The mock cases should represent a variety of firearms with varying safeties. At least one mock case must include a full auto Glock.

11.4.4.1.1. The trainer will create the mock cases where authorized analysts acted as the primary. The trainer will create an answer key for each case record that includes the defects expected to be identified by the reviewer.

11.4.4.1.2. Successful completion means the trainee does not miss any technical errors with high or moderate impact (as defined by section guidelines). A maximum of one technical error with low impact may be missed per mock case, and a maximum of 2 administrative errors missed per mock case are allowed.

11.4.4.1.3. If the above criteria are not met, the student must repeat the competency. If the student does not successfully complete a competency on the second attempt, the trainer will evaluate the area(s) of concern and assign appropriate practical exercise for the trainee to complete before he/she attempts the competency again.

11.4.4.2. NIBIN Only Notifications (Fired Evidence Processing)

Competency as a NIBIN Only reviewer of fired evidence processing requests requires that the trainee is currently authorized to conduct independent casework in NIBIN processing of fired evidence. The student must complete 5 mock cases as a reviewer. The mock cases should represent cases with varying complexity. At least one mock case must include an item that was not imaged.

11.4.4.2.1. The trainer will create the mock cases where authorized analysts acted as the primary. The trainer will create an answer key for each case record that includes the defects expected to be identified by the reviewer.

11.4.4.2.2. Successful completion means the trainee does not miss any technical errors with high or moderate impact (as defined by section guidelines). A maximum of one technical error with low impact may be missed per mock case, and a maximum of 2 administrative errors missed per mock case are allowed.

11.4.4.2.3. If the above criteria are not met, the student must repeat the competency. If the student does not successfully complete a competency on the second attempt, the trainer will evaluate the area(s) of concern and assign appropriate practical exercise for the trainee to complete before he/she attempts the competency again.

11.4.4.3. NIBIN Lead Notifications

Competency as a NIBIN Lead reviewer requires that the trainee is currently competent to conduct independent casework in NIBIN Correlation review. The



student must complete 5 mock cases as a reviewer. The mock cases should represent cases with varying complexity. At least one mock case must include a Lead requiring a reprint.

- 11.4.4.3.1. The trainer will create the mock cases where authorized analysts acted as the primary. The trainer will create an answer key for each case record that includes the defects expected to be identified by the reviewer.
- 11.4.4.3.2. Successful completion means the trainee does not miss any technical errors with high or moderate impact (as defined by section guidelines). A maximum of one technical error with low impact and one administrative error missed per mock case are allowed.
- 11.4.4.3.3. If the above criteria are not met, the student must repeat the competency. If the student does not successfully complete a competency on the second attempt, the trainer will evaluate the area(s) of concern and assign appropriate practical exercise for the trainee to complete before he/she attempts the competency again.

11.5. Estimated Training Time

120 hours