SAFETY MANUAL

ILLINOIS STATE POLICE

Division of Forensic Services

Forensic Sciences Command

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SM Rev. 16 (09/15/2023)

All policies/guidelines presented in this manual are issued under the authority of the Director of Quality Assurance. These policies/guidelines are reviewed annually by the Command Safety Committee to recommend updates, changes, or additions as needed.

Issuance authorized by: Tranellie Collins

Tranellie Collins, Acting Director of Quality Assurance

Illinois State Police
Division of Forensic Services
Forensic Sciences Command

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A. It is the policy of the Forensic Sciences Command that personnel will adhere to established safety guidelines.

B. A safety committee composed of the Director of Quality Assurance, Assistant Director of Quality Assurance, casework and indexing DNA technical leaders, Safety Officers from each operational laboratory and the Training/Applications laboratory shall oversee the Safety Assurance Program. The Director of Quality Assurance will serve as chairperson of the committee.

1. Terms of appointment. Appointment to the Forensic Sciences Command Safety Committee is a duty of the Laboratory Safety Officer and shall end only upon his/her replacement as Safety Officer.

2. Meetings. The committee shall meet at least once per year. Additional meetings may be called as warranted by safety issues affecting laboratory operations.

C. Safety Responsibilities. Command Administration, Laboratory Management, Laboratory Safety Officers, Safety Committee members, and each individual are responsible for the Command Safety Program.

1. Command Administration

   a. Provide facilities, equipment, and maintenance to ensure a safe working environment.

   b. Implement reasonable steps to identify, eliminate, and reduce exposure of employees and visitors to accidental injury or to conditions which may adversely affect their health.

   c. Provide direction for the program through the Director of Quality Assurance.

2. Forensic Sciences Command Safety Committee

   a. Provide educational materials.

   b. Assist laboratory management in teaching safety rules, regulations, and procedures.

   c. Recommend changes in safety rules, regulations, and procedures as necessary.

3. The Laboratory Director has overall responsibility for laboratory safety, including the following:

   a. Assures that all employees follow the Chemical Hygiene Plan (CHP), Bloodborne Pathogen

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Exposure Control Plan (BBP), and all other safety regulations of the Forensic Sciences Command; assures that an annual review of the plans is conducted and documented.

b. Assures that protective equipment is available and in working order. Laboratory safety equipment must be regularly appraised and modified, replaced, or repaired as necessary.

c. Assures that appropriate training is provided to all laboratory employees.

d. Assures that the facility has the following:

(1) An appropriate general ventilation system with air intakes and exhausts located to avoid intake of contaminated air;

(2) Adequate, well-ventilated stockrooms/storerooms;

(3) Laboratory hoods and sinks;

(4) Other safety equipment, including eyewash fountains and drench showers; and

(5) Arrangements for waste disposal.

e. Reviews the quarterly safety inspections of the laboratory.

f. Has access to knowledge of the current Federal, State, and local regulations pertaining to laboratory safety.

g. Makes sure that each laboratory worker has access to a copy of the Procedures Manual for his/her section. These manuals contain procedures for the analysis of the different types of evidence found in the laboratory.

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h. Appoints a Laboratory Safety Officer and establishes a joint Labor/Management Laboratory Safety Committee.

i. Assures that laboratory work conducted, and its scale, is appropriate to the physical facilities available and the quality of ventilation.

j. Reviews injury and incident reports to determine whether safety procedures have been violated and whether changes in procedures or equipment are warranted.

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k. Assures the following records are maintained:

(1) Chemical Hygiene Plan/Employee Review Sheets;

(2) Bloodborne Pathogen Exposure Control Plan/Employee Review Sheets;

(3) Employee Chemical Exposure Records;

(4) Employee Medical Records; and

(5) Employee Safety Training File.

4. Supervisory Personnel

a. Assures that all employees under their supervision follow the Chemical Hygiene Plan (CHP), Bloodborne Pathogen Exposure Control Plan (BBP), and all other safety regulations of the Forensic Sciences Command.

b. Monitor procurement, use, and disposal of chemicals in the laboratory.

c. Have access to knowledge of current Federal, State, and local regulations pertaining to laboratory safety.

5. Laboratory Safety Officer

a. Serves in the capacity of the Chemical Hygiene Officer as specified in OSHA standard 29 CFR 1910.1450.

b. Works with laboratory management and other employees to develop and implement appropriate laboratory safety policies and procedures which will be documented in the laboratory Facility Operations Manual (FOM).

c. Has access to current Federal, State, and local regulations pertaining to laboratory safety.

d. Seeks ways to improve various laboratory safety documents, including the following:

(1) Chemical Hygiene Plan;

(2) Bloodborne Pathogen Exposure Control Plan;

(3) Disaster Preparedness Plan; and

(4) Laboratory Safety Manual.

Laboratory safety documents will be reviewed annually by the Laboratory Safety Officer and will then be reviewed by the Laboratory Director before modified versions of plans are implemented.

e. Chairs the Laboratory Safety Committee.

f. Conducts meetings with laboratory personnel to inform them of any developments in laboratory safety.

g. With the assistance of the Laboratory Safety Committee, conducts quarterly laboratory safety inspections and reports on the findings (utilizing Appendix 1.1).

h. Maintains a file for Safety Data Sheets (SDS) for all chemicals in the laboratory.

i. Assures that a list of chemicals located in the laboratory is sent to the local fire department every two years, or that a current listing is available to the fire department as needed, if the local fire department does not want a list sent to them.

j. Determines and recommends provision of the required level of protective apparel and equipment needed for current procedures and for new procedures that might be implemented and assure that proper protective apparel and equipment is provided.

k. Recommends adequate facilities and training for use of any material being ordered.

6. Laboratory Safety Committee

a. Helps the Laboratory Safety Officer fulfill his/her responsibilities.

b. Helps the Laboratory Safety Officer in coordinating safety training.

c. Recommends changes in safety rules, regulations, and procedures to keep pace with technological advancements and legal requirements.

7. Laboratory Workers

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a. Read and follow the Chemical Hygiene Plan, Bloodborne Pathogen Exposure Control Plan, and other laboratory safety guidelines.

b. Learn the safety and health hazards of the chemicals, procedures, and equipment they use in the laboratory.

c. Plan and conduct each procedure according to laboratory safety regulations.

d. Become thoroughly acquainted with the location and use of safety equipment, such as showers, eyewash stations, and fire extinguishers.

e. Be alert for unsafe conditions and reporting them to their immediate supervisor and the Laboratory Safety Officer; report new equipment/procedures being used that may create a change in safety equipment or personal protective equipment that is provided.

f. Participate in laboratory safety training.

g. Develop good personal safety habits.

h. Review the Bloodborne Pathogen Exposure Control Plan annually and after any revision is made; review the Chemical Hygiene Plan annually and after any revision is made. Each employee will sign and date the appropriate review sheet to show that he/she has read and understands the plan.

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FORENSIC SCIENCES COMMAND

SAFETY MANUAL APPENDIX 1.1

SAFETY AUDIT CHECKLIST

GENERAL LABORATORY

Criteria	Yes	No	N/A
Does the facility operations manual (FOM) contain a safety program?			
Is the laboratory safety program monitored regularly and reviewed annually to ensure effectiveness?			
Is an employee designated as the safety officer?			
Are all entrances, exits, hallways and stairways clear of obstructions?			
Are all walk areas free of electrical cords/extension cords?			
Are all materials stored in a safe manner?			
Are soap and hot water available at each sink?			
Are emergency telephone number(s) posted on all laboratory phones?			
Are emergency evacuation maps posted in all necessary areas for employees and visitors to utilize in emergency situations?			
Are portable heaters (when approved) plugged directly into the wall socket?			
Is appropriate space provided for safe storage of volatile, flammable, and explosive materials?			
Are emergency exits from the laboratory adequate for safe exit in an emergency?			
Is there general cleanliness and apparent good housekeeping in the laboratory?			
Is a written procedure established to follow in the event either the electricity or water is shut-off?			
Are there written safety procedures for fires, earthquakes, tornados, and bomb threats?			
Are safety drills for fire, bomb threats, earthquakes, and tornados practiced annually?			
Are safety training records and appropriate medical records maintained according to SM-3?			

Criteria	Yes	No	N/A
Are drinking and eating areas specifically designated in the facility;			
Is there observed compliance of the eating/drinking policies?			
Are the lighting levels adequate in all areas of the building?			
Is this Safety Audit Checklist completed quarterly?			

SAFETY EQUIPMENT/PPE

Criteria	Yes	No	N/A
Does the laboratory have available and encourage the use of safety devices, particularly those required by its safety program?			
Are the appropriate employees aware of the location of and instructed in the use of safety devices?			
Are all fire extinguishers certified annually, inspected monthly, readily accessible, and properly mounted?			
Are Fire blankets properly mounted and easily accessible (if available)?			
Are the safety showers activated monthly and the eye washes activated weekly to verify correct operation and to flush the systems?			
Are the safety showers and eye washes unobstructed and properly located?			
Are sufficient exhaust hoods available to maintain a safe work environment?			
Are hoods clean and uncluttered?			
Are the fume hoods certified on an annual basis by a qualified service vendor?			
Are sufficient first aid kits available and strategically located?			
Are all first aid kits stocked with the minimum materials? (See Appendix 1.2)			
Are all trauma kits, when present, stocked with the minimum materials? (See Appendix 1.2)			
Are AEDs stocked and in working order?			
Are AED checks logged?			
Does the laboratory have an adequate number of personnel trained in First Aid, CPR, and AED?			
Are the Chemical spill kits available and well stocked?			
Are Biohazard spill kits available and well stocked?			

Criteria	Yes	No	N/A
Are all Narcan units available for use unexpired?			
Are Narcan units available and strategically placed?			
Do all technical personnel assigned to the laboratory have appropriate personal protective equipment?			
Is there observed compliance of employees wearing laboratory coats, safety glasses/goggles and gloves when appropriate?			
Are personnel utilizing X-Ray equipment protected by an X-Ray monitoring system?			

CHEMICAL SAFETY

Criteria	Yes	No	N/A
Are Safety Data Sheets (SDS) for all chemicals used in the laboratory readily available?			
Are instructions and procedures available for handling and using carcinogenic, toxic, and/or dangerous substances and are the instructions followed?			
Are instructions posted near each instrument stating radiation hazards, safe working practices, and symptoms of acute localized exposure to radiation, applicable emergency procedures, and "chain of command" of persons to be contacted in the event of an emergency or malfunction?			
Are all chemical stock bottles and secondary containers labeled with contents, date received, identity of receiving personnel, and expiration date (clearly noted, if none). Is a NFPA label or appropriate pictogram(s) present on the bottle or secondary container?			
Are chemical bottle carriers available for use while transporting chemicals?			
Is broken glassware disposed of in a specially marked container?			
Are glass/biohazard disposal boxes used properly, not overflowing, and large boxes taped (bottom of box)?			
Are all analytical laboratory refrigerators free of food items?			
Are all laboratory refrigerators that are not used for food storage labeled appropriately?			
Are flammables storage refrigerators used when appropriate?			
Are all compressed gas cylinders and pressurized gas lines properly labeled and routinely checked for leaks?			

Are gas cylinders clamped tightly after being positioned for use, away from heat and flame?			
Does the laboratory have documented periodic annual safety instruction and review programs which cover various topics, including at a minimum – Blood-borne Pathogens, Chemical Hygiene, Narcan awareness and yearly Command topics?			

SECTION SPECIFIC

Criteria	Yes	No	N/A
Are the UV lights in the biological safety cabinets tested monthly?			
Is blood lead and ZPP testing conducted semi-annually on firearms personnel?			
Are test firing warning systems utilized and properly installed at the entrance to the shoot room or firearms section?			
Is the range/shoot room cleaned according to schedule?			
Are laser kill switches/emergency shut offs activated quarterly to verify correct operation?			
Are laser goggles inspected twice a year?			
Are oxygen sensors present and in working order where liquid Nitrogen is used and stored?			
Is diethyl ether disposed of after 3 years from purchase or at its manufacturer's expiration date, whichever is sooner?			

Signature _____ Date _____

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SAFETY MANUAL APPENDIX 1.2

FIRST AID AND TRAUMA KIT MINIMUM CONTENT REQUIREMENTS

MINIMUM COMPONENTS OF A FIRST AID KIT (ANSI Z308.1 2015, CLASS A)

First Aid Supply	Suggested Minimum Quantity	Suggested Minimum Size or Volume	
		(U.S.)	(Metric)
Adhesive Bandage	16	1 x 3 in	2.5 x 7.5cm
Adhesive Tape	1	2.5 yd (total)	2.3 m
Antibiotic Application	10	1/57 oz	0.5 g
Antiseptic	10	1/57 oz	0.5 g
Breathing Barrier	1		
Burn Dressing (Gel Soaked)	1	4 x 4 in	10 x 10 cm
Burn Treatment	10	1 /32 oz	0.9g
Cold Pack	1	4 x 5 in	10 x 12.5 cm
Eye Covering (with Means of Attachment)	2	2.9 sq. in	19 sq. cm
Eye/Skin Wash	1 fl oz total		29.6 mL
First Aid Guide	1	N/A	N/A
Hand Sanitizer	6	1/32 oz	0.9 g
Medical Exam Gloves	2 pair	N/A	N/A
Roller Bandage (2 inch)	1	2 in x 4 yd	5 cm x 3.66 m
Scissors	1	N/A	N/A
Sterile Pad	2	3 x 3 in	7.5 x 7.5 cm
Trauma Pad	2	5 x 9 in	12.7 x 22.9 cm

Triangular Bandage	1	40 x 40 x 56 in	101 x 101 x 142 cm

MINIMUM COMPONENTS OF A TRAUMA KIT

MAIN POCKET

1. Scissors
2. (4) Large Gauze Rolls
3. (6) Triangular Bandages
4. (2) White Multi Trauma Dressings
5. (2) Masks
6. (1) Dark Blue Emergency Isothermal Blanket
7. (1) Petrolatum Gauze Pad
8. (4) Combine Dressing 5"x9"
9. (5) Dressing Sponges 4"x4"
10. (1) CPR Mask (Blue Pouch - inner bag sealed)
11. (4) Small Gauze Rolls
12. (1) Stethoscope
13. (1) Blood Pressure Cuff

FRONT POCKET

1. (1) Pack Adhesive Bandages
2. (2) Pair of Gloves
3. (1) Blue Burn Sheet
4. (1) Roll of Adhesive Tape
5. approx. (6) antiseptic towelettes in clear bag
6. (1) Glucose Tube

EACH SIDE POCKET

1. (1) SAM Splint
2. (1) Cold Pack

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A. The following rules serve as general guidelines to laboratory safety.

1. Minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals are to be adopted rather than specific guidelines for particular chemicals. Skin contact with chemicals should always be avoided.

2. Observe OSHA's Permissible Exposure Limits (PELs).

3. Use Universal Precautions when handling potentially infectious materials.

4. Avoid working in the laboratory alone. Do not work alone if the procedures being conducted are hazardous.

5. Visitors will be escorted by laboratory personnel while in the laboratory.

6. Do not smell or taste chemicals.

7. Wash hands before leaving the laboratory work area or after handling chemicals or biological materials.

8. Be alert for signs of toxic chemical exposure to yourself and co-workers. Headache, nausea, dizziness, and skin irritation may indicate toxic chemical exposure. Leave area until the presence or absence of a hazard has been determined.

9. Flammable liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.

10. Do not pipet by mouth. Use a pipet bulb, a pipet pump, a transfer pipet, or a pipettor.

11. Keep work areas clean and uncluttered. Chemicals and equipment should be properly labeled and stored in approved areas only.

12. Be alert to unsafe conditions or actions. Bring unsafe conditions or actions to the attention of the Laboratory Director, an Assistant Laboratory Director, or the Laboratory Safety Officer. Should any of the unsafe conditions/actions have a potential to affect test results, testing will be suspended until the condition/action is corrected.

13. Smoking is prohibited in laboratories.

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14. Food and drinks.

    a. Each laboratory will establish eating and drinking areas as outlined in SM 3, Health Precautions/Prevention of Contamination.

    b. Food is not to be stored in laboratory refrigerators or freezers designated for analytical purposes.

    c. Laboratory analytical ovens and dryers are not to be used to heat food.

15. Storage of outer wear such as coats, umbrellas, and secondary boots.

    a. Outer wear must be stored in such a way that contamination of the outer wear by chemicals and biohazardous materials is prevented.

    b. Outer wear is not to be stored in analytical areas.

    c. Outer wear is not to be stored where it might be contaminated by previously worn lab coats.

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A. Precautions for handling evidence *potentially* contaminated with HIV or other communicable hazards

1. The selection of an appropriate biosafety level for work with a particular agent is dependent upon a number of factors. The most important of these include the virulence, pathogenicity, biological stability, and communicability of the agent; the nature of the laboratory; the quantity and concentration of the agent; the endemicity of the agent; and the availability of effective vaccines or therapeutic measures.

2. The biosafety level employed for activities involving infectious agents should be commensurate with that required for the agent of highest virulence known or likely to be encountered in the course of contemplated work.

3. The following standard and special practices will be followed by the Forensic Sciences Command until further information is available from the CDC (http://www.cdc.gov), OSHA (http://www.osha.gov), etc.

   a. Gloves

      (1) Gloves will be worn when handling biologically stained evidence in the laboratory and in court.

      (2) Only nitrile, latex or other appropriate gloves will be worn.

      (3) Double gloves should be used when handling liquid biohazards.

      (4) Gloves (lab coats, masks) will be removed prior to leaving the evidence examining area.

   b. Masks should be worn when there is a possibility of aerosols, when handling liquid blood, and/or during scrape down.

   c. Protective eye wear with side shields will be required during scrape down and when handling liquid blood.

   d. Scrape down Process

      (1) Specific areas will be set aside for the scrape down process.

      (2) Items such as pens, tweezers, etc., used during the scrape down process will remain in this area and will not be transferred out unless they are disinfected.

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B. Testing/Vaccinations

1. Blood lead and zinc protoporphyrin (ZPP) tests are provided semi-annually for firearms examiners.

   a. Employees wishing not to participate must sign a waiver (Appendix 3.3).

2. Hepatitis B Immunization and Vaccinations and serology (titer) testing

   a. Refer to ISP OPS-009 for guidance related to this topic.

   b. Those employees not wishing immunization must sign a waiver.

      (1) Appendix 3.1

      (2) Appendix 3.2

      (3) The Laboratory Director or designee will coordinate appointments and handle invoices for payment. Questions should be directed to the Division of Forensic Services Hepatitis B Coordinator.

C. Medical Records

1. Medical records noted below will be kept for each employee and are the responsibility of the individual laboratory. They are to be treated in a confidential manner.

   a. Hepatitis B vaccinations and any follow-up.
   b. Blood lead testing.
   c. Hearing tests.
   d. Injury records, including physician reports and follow-up.
   e. Exposure incidents, either chemical or blood-borne, and any reports from physicians regarding findings.

2. Retention of records

   Records will be retained for 30 years past the employee's last date of service.

3. Transfer of records

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Records will be transferred with the employee as they move from one location to another, with the final retention (as prescribed in #2, above) made at the last location of employment/service.

D. Eating and Drinking in the Laboratories

1. The Laboratory Director is responsible for the protection of all laboratory employees and facilities. Part of this responsibility is to ensure that laboratory safety policies are followed and that the appropriate precautionary measures are taken.

   a. Chemical Hygiene Rule

      (1) Eating, drinking, smoking, gum chewing, and the application of cosmetics is not permitted in forensic science work areas where hazardous chemicals are present. After working where hazardous chemicals are present, hand washing is required before eating, drinking, smoking, gum chewing, and applying cosmetics. Hazardous chemical is defined as:

> A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

      (2) Forensic science work areas are defined as any laboratory room in which activities occur where hazardous chemicals are present

   b. Bloodborne Pathogen Exposure Rule

      (1) Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses is not permitted in forensic science work areas where there is a reasonable likelihood of occupational exposure. After working where there is a reasonable likelihood of occupational exposure, hand washing is required before eating, drinking, smoking, gum chewing, and applying cosmetics. Occupational Exposure is defined as:

> Reasonably anticipated skin, eye, mucous membrane, or

parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

(2) Other potentially infectious materials are defined as:

Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, all body fluids in situations where it is difficult or impossible to differentiate between body fluids; any unfixed tissue or organ from a human; HIV-containing cell or tissue cultures, organ cultures, and HIV-or-HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

(3) Forensic science work areas are additionally defined as any laboratory room in which activities occur where there is a reasonable likelihood of occupational exposure. For the purpose of the Forensic Sciences Command, there is a reasonable likelihood of occupational exposure in any laboratory room where materials containing physiological fluids, liquid or dried, are present.

c. Non-Work Area Rule

(1) Persons entering non-work areas are not permitted to wear laboratory safety wear (*e.g.*, lab coats and latex gloves) in non-work areas.

(2) Persons who have been engaged in analysis involving physiological fluids, liquid or dried, or hazardous chemicals in work areas are required to wash their hands before entering non-work areas.

d. Individual Laboratory Plans Rule

(1) Each Laboratory Director will develop specific standards reflecting ***his/her*** particular situation based upon the above requirements. ***Eating, drinking, or smoking in the vicinity of the computers may damage the equipment or data files. Laboratory Directors are to consider these facts when developing their standards.*** A floor diagram delineating work and non-work areas will be created and displayed in key areas of the laboratory.

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E. Syringes, Sharps, and Potential Sharps

The following guidelines were designed to safeguard employees from accidental needle sticks and cuts. All employees must adhere to the guidelines when receiving and analyzing submitted evidence containing syringes, sharps, and potential sharps.

Purpose

- To set an action plan that will eliminate or minimize employee exposure to bloodborne pathogens.
- To set a protocol for processing syringe/needle cases submitted into the laboratory.
- To set a protocol for processing sharp and potential sharp cases submitted into the laboratory.

1. Submission Requirements

The following types of evidence will be analyzed if it is the **ONLY** evidence in the case. Also, a suspect needs to be identified, and appropriate charges must be considered.

a. Syringes/Needles

(1) All syringes must be approved by laboratory management and verified with the SAO when appropriate.

(2) Unless the syringes were transferred from the Toxicology section, the Chemistry Section will only analyze syringes that laboratory management previously approved (see above E.1.a).

(3) Toxicology will only consider analyzing syringes with at least 0.5 ml of liquid blood.

(4) All syringes transferred to the Toxicology Section from other ISP Laboratories must be approved by laboratory management **before** being transferred and meet the requirement of this policy.

b. Broken glass pipes, razor blades and other sharps

c. Items with the potential to be sharps (glass pipes, mirrors, etc.)

2. Proper Packaging

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a. Syringes

(1) Syringes must be individually packaged

(2) Must be capped or corked to prevent needle sticks

(3) Placed in a clear puncture proof container

(4) Sealed in a clear outer container that is properly labeled and marked as a bio-hazard and a sharp

b. Broken glass pipes, razors, sharps

(1) Must be in a puncture proof container and secured within to prevent sticks

(2) Sealed in an outer container that is properly labeled and marked as a sharp

c. Potential sharps

(1) Must be packaged to prevent breakage

(2) Sealed in an outer container that is properly labeled and marked as a potential sharp

3. Engineering and Work Practice Controls

a. All procedures involving blood or other potentially infectious materials will be performed in such a manner as to minimize splashing, spraying, spattering and generation of droplets of these substances.

b. Each section working sharps cases will have a hood designated for use with syringe, sharp and potential sharp cases. This may be any hood, but designating specific ones allows for all proper bloodborne pathogen procedures and clean-up to be directed to specific locations.

c. Laboratory bench surfaces should be cleaned with a 10% bleach solution after analysis.

d. Laboratory procedures for personal protective equipment must be followed when analyzing syringes, sharps, and potential sharps.

e. Employees must wash their hands immediately or as soon as feasible after removal of gloves

or other protective equipment.

f. All biological waste will be collected in an appropriate bio-hazard waste container and prepared for a pick-up by an external bio-hazard waste company.

g. Needles will not be bent, broken, or removed.

4. Suggested Procedures for the Analysis of Syringes

The following suggestions are recommended to minimize or avoid any potential hazards associated with the analysis of syringes.

a. To avoid a needle stick

(1) Never place your hand in an evidence bag to remove contents. Evidence bags should be cut open and the items emptied onto the workbench. Preliminary steps should be taken to avoid contamination.

(2) Follow the above procedures for capped and uncapped syringes that are submitted.

b. To avoid a plunger stick

If a syringe consisting of a plunger and no needle is present, slowly and carefully remove the plunger and place inside a clear, sealable puncture resistant container. The remaining portion of the syringe can be analyzed.

c. Sample removal from syringes

(1) Removing the plunger. (Do Not Uncap Needle) **CAUTION:** Breaking a vacuum may cause splashing, spraying and spattering. DO NOT use significant force when removing plungers.

(2) Dispensing through the needle. **CAUTION:** Uncapping needles is hazardous, and any such recapping must be accomplished by the use of a one-handed technique. DO NOT use significant force when removing the cap from the needle

i. Use reverse technique first. Slowly draw solvent into syringe before dispensing.

ii. Dispense contents through needle into test tube or suitable container.

d. To repackage evidence

(1) Place all syringe components into a clear, sealable puncture resistant container. No attempt should be made to recap or replace the barrel. The syringe is placed in a clear container so the contents are visible.

(2) Package residue vials separately.

(3) Always clean workbench using the protocols mentioned in the above procedure.

5. Suggested Procedures for the Analysis of Other Sharps

a. Sample removal from sharps and potential sharps. **CAUTION**: If possible, all broken glass and other sharps should be handled with forceps or tweezers

(1) Wash with an appropriate solvent

(2) Removing with a cotton swab

(3) Scraping with a spatula

b. Repackaging

(1) All sharps and potential sharps should be repackaged in such a manner that safeguards employees from sticks, cuts and lacerations.

(2) The outer packaging of cases containing sharps and potential sharps will be marked with appropriate warning labels.

(3) Convenience packaging can be used to store items that contain potential sharps.

(4) Store items containing potential sharps below eye level.

H. Hoods

1. **Fume hoods used for general laboratory operations.** Hoods used for most materials and laboratory operations must be certified by a vendor annually and have an average face velocity of

80 feet per minute or greater. If the average face velocity is less than 80 feet per minute, appropriate laboratory personnel (e.g. the laboratory's safety committee, laboratory safety officer, and Laboratory Director) will determine whether the fume hood will be taken out of service until it meets the parameters or used for operations in which hazards are not high (see below H.2).

2. **Fume hoods used for materials or operations in which hazards are not high.** Hoods with an average face velocity less than 80 and more than 60 feet per minute may be used under the conditions outlined below for operations involving low-toxicity materials (e.g. acetone, ethanol, and aliphatic hydrocarbons) and for relatively non-hazardous operations (e.g. procedures in which nuisance dusts and fumes are created).
   a. Fume hoods may be designated for such purposes only with the approval of the laboratory's safety committee and the concurrence of the laboratory safety officer and the Laboratory Director.

   b. Fume hoods designated and approved for use only for low-toxicity materials and relatively non-hazardous operations must be marked with a sign indicating the restrictions on their usage.

3. **Biological safety cabinets.** Vertical laminar flow biological safety cabinets must have an average inward face velocity at the normal work opening of at least 75 feet per minute.

I. Safety Regulations Regarding Miscellaneous Items.

1. **Jewelry.** Jewelry may be worn in the laboratory as long as it does not pose a safety hazard to the individual wearing it, i.e., excessively long chain necklaces.

2. **Contact Lenses.** Appropriate eye protection will be worn by all employees wearing contact lenses when working with chemicals.

3. **Ties.** As long as ties are secured by a tie tack, tie bar or laboratory coat, they may be worn in the laboratory.

4. **Sandals.** Sandals will not be worn in the laboratory.

5. **Earphone Devices.** Listening devices will only be used to conduct official ISP business (WebEx, training, teleconferences, etc.) while in the laboratory. Listening devices are only permitted in administrative areas of the laboratory where evidence is not allowed. Listening devices may not be used or worn while conducting, evaluating, or reviewing analytical work or walking in hallways, stairwell and elevators. All listening devices must be approved by

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laboratory management or the Safety Officer prior to use. Only listening devices that allow for situational awareness (e.g., bone conduction earphones or similar with transparency mode) will be approved for use in the laboratory. When not in use, all listening devices must be stored in such a way that minimizes the risk of contamination by biological, chemical, or toxic substances.

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SAFETY MANUAL APPENDIX 3.1

HEPATITIS B IMMUNIZATION PROGRAM RECORD

I. Check the box below if you have read the pre-screening instructions for receiving the Hepatitis B vaccine, and questions were answered to your satisfaction.

☐ I have received Blood-borne Pathogens Training concerning Hepatitis B.

II. **Acknowledgment of Immunization:**

☐ I previously received the three-dose hepatitis B immunization. Therefore, I am not requesting the Illinois State Police provide this immunization series.

This immunization was / was not provided by the Illinois State Police. (circle one)

☐ I recently began the hepatitis B series, I've received the first / second (circle one) dosage of the vaccine, and I request the Illinois Slate Police to provide the remaining immunization series at no cost to me.

Date of last dose: _____

III. **Request for Immunization:**

☐ I hereby request to receive the three-dose hepatitis B immunization series from the Illinois State Police, at no charge to me.

IV. **Declination for Immunization:**

☐ I understand that due to my occupational exposure to blood and other potentially infectious materials, I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to me. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me only if received through the Illinois State Police.

V. **Declination for Serology (titer) testing after receiving vaccination or for employees previously vaccinated prior to employment with ISP:**

☐ I understand that due to my occupational exposure to blood and other potentially infectious materials, I may be at risk of acquiring hepatitis B virus (HBV) infection, I am vaccinated against HPV and have been given the opportunity to be serology (titer) tested to determine the efficacy of my vaccination for hepatitis B, at no charge to me. However, I decline hepatitis B serology (titer) testing.

Printed Name:	
Last 4 digits of SSN:	
Signature:	
Date:	

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SAFETY MANUAL APPENDIX 3.2

HEPATITIS B IMMUNIZATION - INTERN WAIVER

- I have received Blood-Borne Pathogens Training concerning Hepatitis B.

Acknowledgment of Immunization (check one box from below):

- I have previously received the three-dose Hepatitis B immunization.
- I recently began the Hepatitis B series. I have received the first/second (circle one) dosage of the vaccine. Date of last dose:_____
- I understand that due to my occupational exposure to blood and other potentially infectious materials, I may be at risk of acquiring Hepatitis B virus (HBV) infection. I understand that by not acquiring the Hepatitis B immunization series on my own, I continue to be at risk of acquiring Hepatitis B, a serious disease.

Printed Name:	
Last 4 digits of SSN:	
Signature:	
Date:	

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SAFETY MANUAL APPENDIX 3.3

WAIVER OF PHYSICAL EXAMINATION

I, _____, waive the physical examination being made available to me. I understand that the examination is provided at no cost to me. I further understand that if at some point in time I feel I should receive the examination, I will submit a request to my supervisor.

Type of examination (circle all that apply):

Lead Testing:

ZPP

Blood Lead

Other:

_____

Printed Name:	
Last 4 digits of SSN:	
Signature:	
Date:	

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A. The timely application of emergency first aid to the victim of an injuring accident may save a life. In the event of an accident leading to serious injury, the first responder is instructed to call "911" and request medical assistance.

1. General Policies

   a. Check the scene to make sure that it is safe for you and for bystanders.

   b. Seek help if necessary. Call 911 if necessary.

B. Laboratory Personnel Certified in First Aid

1. It is recommended that 15% of each laboratory's staff be certified in first aid.

2. Each laboratory will maintain a list of personnel certified in first aid which is updated as needed. Re-certifications will be carried out as necessary.

C. Laboratory Personnel Certified in CPR

1. It is recommended that 15% of each laboratory's staff be certified in CPR.

2. Each laboratory will maintain a list of personnel certified in CPR which is updated as needed. Re-certifications will be carried out as necessary.

D. Laboratory Personnel Certified in AED

1. It is recommended that 15% of each laboratory's staff be certified in the use of an AED.

2. Each laboratory will maintain a list of personnel certified in AED which is updated as needed. Re-certifications will be carried out as necessary.

3. AEDs are equipped with a self-monitoring device that will signal if there is device failure.

4. Each laboratory is responsible for inspecting AEDs on a quarterly basis. This check may coincide with safety audits outlined in QM-1 and must be logged on the device or preferably at aedprotracker.com. Supplies for the AED, i.e., battery pack, pads, etc., are to be replenished when deemed necessary.

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A. Accidents involving personal injuries (refer to ISP Directives PER-29 for additional information)

1. If capable, the employee immediately notifies their supervisor of the accident's occurrence.

2. If the injury is non-life-threatening, the employee or their supervisor calls Gallagher Bassett Services, Inc. (833-891-1372) prior to seeking treatment. Minor injuries should be reported prior to leaving the job site, when possible. All incidents should be reported within 24 hours, and the reporter should obtain a report number.

3. Management will record the accident on the Log and Summary of Work-Related Injuries and Illnesses (OSHA 300).

4. The forms listed below are filled out by appropriate personnel, with originals submitted through laboratory management to the Illinois State Police Public Safety Shared Services Center (PSSSC) Worker's Compensation Coordinator (WCC) and copies forwarded to the Administrative Officer at the Forensic Sciences Command Headquarters. The Forensic Sciences Command Accident Evaluation Report (ISP 6-202) and Demands of the Job (ISP 2-701) forms are available in the ISP Document Library. The Gallagher Bassett Services, Inc. forms are available at the CMS website for state employee benefits: https://cms.illinois.gov/benefits/rm/workerscompensation.html .

Employee: **Medical Authorization Forms (IL 3-2013)**
Employee's Notice of Injury (IL 401-0012)
Forensic Sciences Command Accident Evaluation Report (ISP 6-202)

Employee's Supervisor: **Supervisor Report of Injury (IL 401-0368)**
Demands of the Job (ISP 2-701) as requested

Treating Physician: **Initial WC Medical Report and Letter (IL 401-0994)**

Witnesses: **Witness Report (IL 401-0370)**

IMPORTANT: The central file number, e.g., 97-W-000, must be recorded on each of these forms.

5. Medical bills received by the claimant should be sent directly to the WCC. Upon each visit to a healthcare provider, the claimant must inform the healthcare provider that the visit is in relation to a workers' compensation claim. All invoices for services must then be directed to Gallagher Bassett Services, Inc.

B. Bloodborne Pathogen or other potentially infectious material (OPIM) exposure incidents (refer to ISP Directives OPS-009 for additional information)

1. Treat all exposures to bloodborne pathogens or OPIMs in the same manner as outlined above for accidents.

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A. Personal protective equipment. Personal protective equipment for eyes, face, head and extremities will be provided, used, and maintained for laboratory work in areas where hazardous materials are being used or examined. Personnel will be properly instructed in its use.

1. Safety glasses

a. The Forensic Sciences Command will provide safety glasses for all personnel whose normal job duties require eye protection.

(1) All personnel will wear eye protection while in designated laboratory work areas.

(2) Wearing of contact lenses is permissible as long as appropriate eye protection is worn with them when working with chemicals, biologicals, or hazardous materials.

(3) Employees requesting prescription safety glasses should provide a prescription and/or personal glasses to the optician in order that prescription safety glasses can be manufactured.

(4) Selection of the optical service and frame/lens minimum specifications will be the exclusive right of the Forensic Sciences Command.

(5) If necessary, due to wear or a change in vision, replacement of safety glasses will be made on a yearly basis.

(6) Replacement of lost safety glasses will be the responsibility of the employee.

(7) The use of safety glasses does not preclude the use of safety shields where required.

b. Current specifications

(1) CR39 plastic polymer safety lens or polycarbonate lens that meet ANSI requirements;

(2) Safety frames only will be furnished; and

(3) Side shields, removable or permanent.

2. Gloves

a. Inspection

(1) Inspect gloves before use.

(2) Discard gloves that are ripped or abraded.

b. Protective gloves are to be worn in the following situations

(1) Any time an analyst has cuts or abrasions on his/her fingers. This is to lessen the chances of an exposure incident;

(2) When handling potentially hazardous materials; and

(3) When processing evidence that is contaminated with or potentially contaminated with biohazards.

(4) When handling samples or open evidence suspected to contain controlled substances.

3. Laboratory coats. Laboratory coats/jackets are included in an individual's personal protective equipment to offer protection from splashes and spills which may occur. The Forensic Sciences Command has developed minimum guidelines for the use and wear of laboratory coats/jackets.

a. Laboratory staff members will be furnished with a supply of laboratory coats which is adequate to meet their need to limit exposure to chemicals or other hazardous materials.

b. Laboratory coats will be worn and kept buttoned while working with biologically stained evidence, hazardous materials, or chemicals; they will also be worn and kept buttoned when working with hairs and fibers to prevent the transfer of these items from the analyst's clothing to case evidence. Laboratory coats will be changed when they become soiled and after working with evidence when the potential for cross contamination exists.

c. Laboratory coats worn in analytical areas will not be worn in lunch/break rooms, administrative offices, conference/ reading rooms, or in clerical areas.

d. Laboratory coats will be worn while receiving/returning evidence that could present a safety hazard or if needed to meet the conditions set forth in ADM-3 for agency contacts. Laboratory coats worn to receive/return evidence will not also be worn in analytical areas.

e. When visitors or vendors are in an area where work with biological evidence, hazardous materials, or chemicals is being conducted, they will be required to wear laboratory coats and safety glasses.

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B. Fire extinguishers.

1. Types of fire extinguishers.

a. Class A fire extinguishers are for fighting fires of ordinary combustible materials such as wood, paper, rubber, and many plastics.

b. Class B fire extinguishers are for fighting fires of flammable liquids, gases, and greases.

c. Class C fire extinguishers are for fighting fires involving energized electrical equipment.

d. Class D fire extinguishers are for fighting combustible metal fires.

e. Halon fire extinguishers are for fighting computer fires or fires involving analytical equipment.

2. Inspection. Extinguishers will be inspected monthly; the inspection tag will be dated and initialed, or information will be maintained in a log. If the information is kept on the tag, the tag will be maintained until re-certification by an outside agency, as per CFR 1910.157.

C. Fire blankets. Fire blankets may be used in case of a clothing fire to smother the fire. The fire blanket is made of a fire-retardant material. It is not fireproof. Wool fire blankets are not suitable for chemical fires.

D. Emergency drench showers. Emergency drench showers can be used in case of a chemical splash to the body or a clothing fire. Showers will be tested monthly (at a minimum), with testing recorded in a log.

E. Eyewashes. Eyewashes are provided for use in the event of a chemical splash to the eyes. Plumbed eyewashes will be tested weekly to ensure proper operation, with testing recorded in a log. Manufacturer's instructions will be followed for the testing and/or replacement of personal eyewashes, which will be recorded in a log.

F. Respirators. Respirators will be used when necessary to perform some job responsibilities. Their use is covered by the respiratory program found in Appendix 6.1.

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SAFETY MANUAL APPENDIX 6.1

RESPIRATORY PROGRAM

The plan contained on the following pages will be utilized and followed in the event it is determined that respirator use is required to perform some job functions.

Abbreviations used in the Forensic Sciences Command Respiratory Program:

OSHA - Occupational Safety and Health Administration

NIOSH - National Institute of Occupational Safety and Health

IDLH - Immediately Dangerous to Life and Health

HCP - Health Care Provider

I. PROGRAM ADMINISTRATION

A. This program will be administered by the Director of Quality Assurance and placed into effect when it is determined that respirator use is required.

B. The effectiveness of this program will be evaluated as indicated in the section AProgram Evaluation.

C. In addition to this written program, the following may be helpful for implementation, administration, and other information.

1. A copy of the OSHA Respiratory Protection Standard 29 CFR 1910.134.

2. The NIOSH Guide to Industrial Respiratory Protection, DHHS (NIOSH) Publication 87-116, September 1, 1987.

3. The NIOSH Respirator Selection Logic 2004, DHHS (NIOSH) Publication 2005-100, October 2004

4. The federal OSHA website: www.osha.gov

5. The NIOSH website: www.cdc.gov/niosh/homepage.html

6. The NIOSH respirator documents on their website: http://www.cdc.gov/niosh/topics/respirators

II. PROGRAM ELEMENTS

A. All jobs/tasks shall be evaluated to determine the need for respirators as described in the section "Respirator Selection".

B. Prior to requiring respirator use, each employee shall be provided with:

1. A determination of the appropriate respirator for their job or task as indicated above;

2. A medical evaluation as described in the section on medical evaluations;

3. A fit test with the appropriate respirator as described in the section on fit testing; and

4. Training as described in the section on training.

C. Annually and whenever needed to ensure the safe use of respirators, each affected employee shall be provided with:

1. A fit test with the appropriate respirator as described in the section on fit testing; and

2. Training as described in the section on training.

D. Respirators shall be used following the manufacturer's recommendations or as described in the section on use of respirators.

E. Respirators shall be stored, cleaned and maintained following the manufacturer's recommendations or as described in the section on maintenance and care.

III. RESPIRATOR SELECTION

A. The Command Safety Committee will evaluate jobs and tasks and select respirators for all affected jobs as indicated in this section.

B. Respirators shall be selected based on the hazards present and used only in conditions which are not oxygen deficient or Immediately Dangerous to Life or Health (IDLH).

C. Each job or task shall be evaluated to determine if respirator use is required.

1. For those jobs requiring respirator use, a respirator evaluation will be made which documents:

(a.) The specific chemical creating the air contamination, and its physical form as either a particulate (dust, fume, mist) or vapor/gas;

(b.) A reasonable estimate of the employee's exposure;

(c.) The appropriate exposure limit;

(d.) The protection factor which the respirator must meet to provide for employee protection;

(e.) A determination of the appropriate class of respirator and air purifying element using the process as indicated in the section ARespirator Selection Process; and

(f.) A list indicating the specific respirators provided which are appropriate for that job/task.

2. Only respirators that are NIOSH approved for the estimated concentration of the specific chemical will be used.

3. A sufficient number of respirator models and sizes will be provided to ensure that the respirator is acceptable to and correctly fits the user.

IV. MEDICAL EVALUATION

1. A designated licensed health care provider who can provide the following will be determined at each laboratory, whenever necessary.

2. The health care provider (HCP) will perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

3. This evaluation will be administered confidentially, at no cost to the employee, during the employee's normal working hours or at a time and place convenient to the employee, and in a manner the employee understands. The employee will have an opportunity to discuss the questionnaire and examination results with the health care provider (HCP).

4. The Laboratory Safety Officer will provide the health care provider (HCP) with the following supplemental information:

(a.) The type and weight of the respirator to be used by the employee;
(b.) The duration and frequency of respirator use (including use for rescue and escape);
(c.) The expected physical work effort;
(d.) Additional protective clothing and equipment to be worn;
(e.) Temperature and humidity extremes that may be encountered;
(f.) A copy of this written respiratory protection program; and
(g.) A copy of the respiratory protection standard (29 CFR 1910.134).

5. Additional medical evaluations may be necessary as determined by the health care provider (HCP).

6. A decision about when the next medical re-evaluation will occur will be made by the health care provider (HCP).

7. The health care provider (HCP) will produce and the Laboratory Safety Officer will receive and keep on file the health care provider's (HCP) written opinion on the employee's ability to use the respirator.

8. These medical records will be kept for thirty (30) years after the last day of employment, as required by OSHA standard 29 CFR 1910.1020.

V. FIT TESTING

1. The Laboratory Safety Officer is responsible for fit testing employees.

2. Prior to initial use, and annually thereafter all employees assigned respirators will be fit tested using one of the methods described in the section on fit testing appropriate for the type of respirator used.

3. Quantitative fit testing procedures (actually measuring the reduction in exposure from the respirator) must be used for all tight fitting face pieces requiring fit factors greater than 100. Qualitative fit testing procedures (using either irritant smoke, isoamyl acetate, saccharine or Bitrex) can be used for fit testing tight fitting face pieces with fit factors of 100 or less.

4. The record of the most recent fit test will be maintained in the employees respirator program file and will contain:

(a.) The name of the employee tested;

(b.) The type of fit test performed;

(c.) The specific make, model, style and size of respirator tested;

(d.) The date of the test; and

(e.) The pass/fail results for qualitative fit tests (or the fit factor and strip chart recording or other recording of the test results for quantitative fit testing).

5. Additional fit testing will be conducted whenever visual observations of changes in the employee's physical condition which could affect respirator fit are indicated. This could include facial scarring, dental changes, cosmetic surgery or an obvious change in body weight, and could be reported by either:

(a.) The employee;

(b.) The health care provider (HCP);

(c.) The supervisor; or

(d.) The program administrator.

VI. TRAINING

1. The Director of Quality Assurance or the Laboratory Safety Officer will provide training to employees as indicated in this section.

2. Employees who are expected to use respirators will be trained:

(a.) Prior to initial use;

(b.) Annually;

(c.) When changes in the workplace or the type of respirator require additional training;

(d.) When the employee has not retained the required understanding or skill as indicated by inadequacies in the employee's knowledge or use of the respirator; and

(e.) Whenever any other situation arises which indicates that additional training is necessary to ensure the safe use of respirators.

3. The training will be understandable to the employee, provided at no cost to the employee, and be comprehensive.

4. Training on the hazards of chemicals will be done according to the chemical hazard communication program.

5. Employees will be trained on the proper use of respirators, including putting them on and removing them, any limitations on their use and maintenance and any other knowledge required for them to complete their tasks as assigned in this program.

6. Employees will be trained until they can demonstrate their knowledge of all of the following:

(a.) Why the respirator is necessary;

(b.) How improper fit, usage, or maintenance can compromise the protective effect of the respirator;

(c.) The limitations and capabilities of the respirator;

(d.) How to use the respirator effectively in emergency situations including situations in which the respirator malfunctions;

(e.) How to inspect, put on and remove, use and check the seals of the respirator;

(f.) The procedures for maintenance and storage of the respirator;

(g.) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

(h.) The general requirements of this program and the OSHA respiratory protection standard.

VII. USE OF RESPIRATORS

1. Specific written operating procedures for the use of respirators, when indicated, will be developed. These procedures will be included as an appendix to this program, included in employee training, and be accessible to employees during their work shift.

2. Standard requirements for respirator users are:

(a.) Any employee having any condition that interferes with the face to face piece seal, including any facial hair that comes between the sealing surface of the face piece and the face, is prohibited from wearing a respirator;

(b.) Any employee having any condition that interferes with valve function, including facial hair, is prohibited from wearing a respirator;

(c.) All personal protective equipment including corrective glasses or goggles must be worn in a manner that does not interfere with the seal of the face piece to the face of the employee;

(d.) Employees shall perform a user seal check each time they put on a tight fitting respirator;

(e.) Supervisors shall monitor all employees using respirators for the degree of employee exposure and stress. Whenever there is a change in working conditions which will affect respirator effectiveness, the use of respirators will be re-evaluated;

(f.) In order to prevent eye or skin irritation associated with respirator use, employees shall leave the work area to wash their faces;

(g.) If employees detect vapor or gas breakthrough, or changes in breathing resistance, they shall leave the work area immediately to replace the respirator;

(h.) If an employee detects leakage of the face piece, they shall immediately leave the work area and only re-enter it with a properly working respirator; and

(i.) If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, the respirator must be replaced before the employee can return to the work area.

VIII. MAINTENANCE AND CARE

1. It is the user's responsibility for ensuring that their respirators are stored, inspected and used according to these standards.

2. Employees with defective respirators should dispose of them immediately.

3. Employees will be provided with respirators that are clean, sanitary and in good working order.

4. Respirators will be stored to protect them from damage, contamination, sunlight, extreme temperatures, excessive moisture, and damaging chemicals.

5. Respirators will be packed or stored to prevent deformation of the face piece and exhalation valve.

6. Employees will inspect their respirators before each use and prior to storing. If any defect is found the respirator will be immediately removed from service and discarded. Inspections will include:

(a.) A check of respirator function;
(b.) A test of the tightness of connections;
(c.) A visual inspection of the conditions of various parts including the face piece, head straps, valves, connecting tube and cartridges, canisters or filters, and any other part that may affect the performance of the respirator;
(d.) A check of elastomeric parts for pliability and signs of deterioration; and
(e.) A check that the label and color coding indicating NIOSH approval is not removed and remains legible on all filters, cartridges and canisters.

7. Repairs or adjustments to respirators will be made only by people appropriately trained to perform such operations.

8. Repairs or adjustments will only use the respirator manufacturer's NIOSH approved parts designed for the respirator.

9. Repairs to respirators will be made only according to the manufacturer's recommendations and specifications for the type and extent of repairs to be made.

10. Reducing and admission valves, regulators and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

IX. PROGRAM EVALUATION

1. The Command Safety Committee will evaluate this program as necessary to ensure that the program is being properly implemented and to consult with employees to ensure that they are using respirators properly. This evaluation will be performed annually.

2. Employees who use respirators will be consulted to determine their views on program effectiveness and any problems with the program.

3. The respiratory protection program administrator will ensure that all problems identified during this assessment are corrected.

4. Initial factors to be assessed during each evaluation include:

(a.) Respirator fit, including the ability to use the respirator without interfering with effective workplace performance;

(b.) Appropriate respirator selection for the hazards to which the employee is exposed;

(c.) Proper respirator use under the workplace conditions the employee encounters;

(d.) Proper respirator maintenance; and

(e.) Any other aspect of this program.

X. RECORD KEEPING

1. The specific record keeping requirements for medical records and fit test records are incorporated into those sections of this program.

2. The current copy of this written program will be maintained by the Director of Quality Assurance.

3. This program and all of the required elements of it, will be provided to the U.S. Department of Labor (OSHA) for examination and copying at their request as required by 29 CFR 1910.134(m)(4).

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A. Chemical spills.

1. There are a variety of materials available for cleanup of chemical spills. See Appendix 7.1 of this manual for Forensic Sciences Command Spill Control Program. Each laboratory will create cleanup procedures based on the materials they have on hand.

2. The material that has been cleaned up from a chemical spill is hazardous waste and will be disposed of as described in SM-7 J. This includes not only the spilled chemical, but items used to clean up the spill, for example, towels and gloves.

B. Biological spills.

1. See Appendix 7.1 of this manual for instructions.

C. Precautions for airborne materials. Whenever the potential exists for powdered materials to become airborne, *e.g.*, when analyzing large drug cases, the following precautions must be taken:

1. Lab coats, safety glasses, and protective masks must be worn; and

2. The removal of samples must be accomplished in a fume hood. If this is not possible due to the size of the exhibit, then removal will be accomplished in a well-ventilated area.

D. Precautions for highly potent substances.

1. Highly potent substances are compounds whose exposure evokes a more significant response at lower concentrations. A list of highly potent substances can be found in Appendix 7.3. Due to the evolving nature of these substances, the list will be updated as needed but should not be considered comprehensive. All substances should be handled with caution.
2. If testing indicates the presence of a highly potent substance, the outer packaging of such evidence will be clearly marked to facilitate proper handling.
3. Evidence containing a highly potent substance may be transferred to other sections at the discretion of the laboratory director or designee. However, if a substance is indicated that prohibits further sampling or analysis in the drug chemistry section, it will not be transferred to any other section.

E. Chemical procurement.

1. All chemicals and reagents received at the laboratory will be labeled with the date received and the initials of the laboratory worker receiving the chemicals.

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2. Safety Data Sheets (SDS) will be given to the Laboratory Safety Officer for retention in a SDS binder.

3. All new chemicals and reagents received at the laboratory will be added to the chemical inventory. The Laboratory Safety Officer will maintain copies of the chemical inventory.

F. Chemical storage.

1. The amount of chemicals stored in the laboratory should be kept to a minimum. The amount of chemicals stored in work areas will be kept to the minimum needed for day-to-day operations.

2. Exposure of chemicals to heat or direct sunlight is to be avoided.

3. Chemicals are to be stored only in designated areas, such as the chemical storage room or flammable solvent cabinet.

4. Stock bottles of flammable liquids should be stored in flammable storage cabinets. Doors to flammable storage cabinets will be kept closed.

5. Flammable or combustible liquids will be stored in closed containers.

6. Chemicals will be stored in accordance with the Chemical Hazard Response Information System (CHRIS) developed by the U.S. Department of Transportation/U.S. Coast Guard (Appendix 7.2).

7. Flammable materials will not be stored in refrigerators or freezers unless the refrigerator or freezer is designed to be explosion proof.

8. Do not store stock bottles of chemicals on bench tops or under workbenches.

9. Chemical storage rooms will be adequately ventilated.

10. An inventory of all chemicals will be conducted annually.

11. Chemicals will be transported from chemical storage areas to work areas using appropriate carriers.

12. Chemicals may be transported from one laboratory to another by staff using durable, watertight containers/packaging for the chemicals involved, or by utilizing a local commercial shipper.

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G. Procedures for working with carcinogens, mutagens, and substances with a high degree of toxicity.

1. Handling carcinogens and mutagens.

   a. Procedures requiring the use of carcinogens and mutagens will be conducted in a fume hood.

   b. Carcinogens and mutagens will be weighed only on an enclosed balance.

   c. Safety glasses, laboratory coats, and chemical resistant gloves will be worn when handling carcinogens and mutagens.

   d. A mask will be worn if there is a chance for exposure to airborne particulates.

2. Areas in the laboratory where carcinogens, mutagens, and substances with a high degree of toxicity may be used will be marked with appropriate signs.

3. Freezers and refrigerators used to store carcinogens and mutagens are to be labeled with an appropriate warning sign.

4. Containers used to store carcinogens and mutagens are to be labeled with an appropriate warning sign.

5. Carcinogens and mutagens will be disposed of in environmentally acceptable ways.

H. Compressed gas cylinder handling procedures. Compressed gases have the potential for both mechanical and chemical hazards. Flammable gases present the danger of fire or explosion. Additional hazards can arise from the reactivity and toxicity of the gas and asphyxiation can be caused by high concentrations of "harmless" gases such as nitrogen. The large amount of potential energy resulting from the compression of gases makes a compressed gas cylinder a potential missile or bomb.

1. Cylinders should have a clearly identified label. Do not rely on the color of the cylinder. Do not accept or use an unlabeled cylinder. Cylinder status (full, in service, or empty) will be shown on each cylinder.

2. Areas containing compressed gases should be posted with signs identifying the gas and precautions.

3. Sparks and flames are to be kept away from gas cylinders.

4. Compressed gas cylinders are to be secured with chains or a clamp and belt. The cylinder valve should be readily accessible.

5. Do not drop, roll, or drag any cylinder, whether full or empty.

6. The main cylinder valve must be kept closed when a cylinder is not in use.

   a. Open main cylinder valve slowly. Open valve completely.

   b. Valve covers must be placed on all cylinders when they are not in service.

7. Gas cylinders are to be used only with the proper regulator.

   a. Do not open a gas cylinder without a regulator.

   b. Do not lubricate threads. Use only Teflon tape.

I. Dispensing and transporting liquid nitrogen.

1. Persons dispensing liquid nitrogen must wear safety glasses, lab coats, and heavy gloves.

2. Persons transporting liquid nitrogen within the laboratory must wear safety glasses and lab coats. (Heavy gloves are optional.)

3. The following types of containers can be used to transport small amounts (one liter or less) of liquid nitrogen within the laboratory:

   a. Heavy-walled Styrofoam (or equivalent) containers, capacity four liters or less, with tops; and

   b. Metal-clad Dewar flasks (or equivalent) with tops.

4. Volumes of liquid nitrogen larger than one liter can be transported only in metal-clad Dewar flasks (or equivalent) with tops.

J. Waste disposal.

1. Chemical waste.

   a. Chemical waste is disposed of in accordance with Federal and Illinois law.

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b. Disposal of laboratory waste by pouring down the drain is permitted under the following conditions:

(1) Water-soluble substances will be poured down the laboratory sink. Flammable solvents should be diluted enough not to be a fire hazard. **Small quantities** of insoluble substances can be poured down laboratory sinks provided they are flushed with large quantities of water.

(2) Strong acids and bases (pH less than 2 or greater than 12.5) must be diluted to a pH range of 3-11 before being disposed of down the drain at a rate of 50 mL/min.

(3) Highly toxic, malodorous, or lachrymatory chemicals (for example, sodium cyanide, pyridine, thionyl chloride) will not be disposed of by pouring down the drain.

c. Large quantities of solid or liquid chemical waste should be collected and stored in their original containers. If the original container is not available, a container suitable for storing hazardous waste may be used. The container should be grounded if necessary.

(1) Hazardous waste containers will be labeled "Hazardous Waste" and have a listing of contents.

(2) Waste solvents that are free of solids, corrosives or reactives may be stored in a common container. Chlorinated solvents and hydrocarbon solvents will be segregated.

(3) Containers of incompatible wastes will be stored separately. For example, containers of acids will be separated from containers of bases, azides will be separated from acids, etc.

d. The Laboratory Director or representative will arrange for the disposal of hazardous waste that cannot be disposed of by pouring down the drain.

e. Acid and organic solvent bottles may be recycled if triple-rinsed after being emptied.

2. Radioactive waste.

a. Radioactive waste is disposed of in accordance with Federal and Illinois law.

3. Potentially infectious waste.

a. Potentially infectious waste (PIMW) is disposed of in accordance with Federal and Illinois law.

b. Contaminated waste other than sharps is placed in labeled or color-coded, leak resistant, closable containers prior to disposal. If outside contamination of the waste container occurs, it is placed in a second labeled or color-coded, leak resistant, closable container.

c. Contaminated sharps are discarded immediately in closable, puncture-resistant, leak-proof, labeled or color-coded containers. Sharps containers must eventually be placed in PIMW boxes. **Unbroken** contaminated glass test tubes and vials, **which are considered to be sharps**, may be placed directly in a PIMW box for disposal. (**Broken** contaminated glass is immediately placed in a sharps container; the sharps container is eventually placed in a PIMW box for disposal.)

4. Regulated Waste.

a. Regulated waste includes the following:

(1) Liquid or semi-liquid blood or other potentially infectious materials which may form a liquid or semi-liquid if compressed;

(2) Items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; and

(3) Contaminated sharps and pathological and microbiological wastes containing blood or other potentially infectious materials.

b. Regulated waste may be disposed of in the following ways:

(1) In PIMW containers; and

(2) Except for sharps, regulated waste may be autoclaved and then disposed of in normal laboratory trash, as described above.

(3) Sharps, even if they have been autoclaved, must be disposed of in PIMW containers.

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SAFETY MANUAL APPENDIX 7.1

SPILL CONTROL PROGRAM

The program contained on the following pages will be utilized by all Command laboratories in the event of a chemical spill. Command laboratories have the option of implementing additional actions/steps to the program but shall not eliminate any of the actions outlined in the Command Spill Program.

SPILL CONTROL PROGRAM

Each Laboratory Director will maintain a list of outside vendors who can assist with the clean-up and disposal of hazardous chemicals.

Spill clean-up supplies will be located in appropriate areas of each laboratory.

If a chemical spill or accident occurs, laboratory staff will:

Attend to any person who may have been contaminated. Provide first-aid, if necessary.

Notify persons in the immediate area of the spill.

Notify the appropriate supervisor and/or laboratory safety officer.

The laboratory director and/or laboratory safety officer will determine if the spill can be safely handled by personnel at the laboratory.

If the spill can be handled by laboratory personnel, the spill will be cleaned up using the appropriate spill clean-up supplies.

If the spill cannot be safely cleaned up, the laboratory director and/or laboratory safety officer will contact an outside vendor to clean up the spill.

The material cleaned up from a chemical spill is hazardous waste and will be handled and disposed of in accordance with guidelines established for disposal of hazardous waste. This includes not only the spilled chemical(s) but also items used to clean up the spill, e.g., towels, gloves.

Each laboratory director and laboratory safety officer/committee will analyze accident and near accident reports to determine if safety rules have been violated and if additional safety equipment or training is necessary.

Each laboratory director and/or laboratory safety officer will report chemical spills involving external intervention/assistance for clean up to the Director of Quality Assurance and the appropriate bureau chief as soon as laboratory personnel in the immediate area of the spill have been safely evacuated and external assistance is in en route.

Procedures for specific types of spills

Mercury:

Exposure to mercury and its vapor can be harmful. Clean up all spills immediately.
Wear proper protective equipment: vapor mask, gloves and goggles.
Ensure proper ventilation.
Use mercury spill control kits and follow the kit directions for clean up and disposal.

Acids:

Ensure adequate ventilation and utilize the appropriate personal protective equipment.

Apply acid neutralizer to the spill from the perimeter inward, applying sufficient neutralizer to obtain a uniform change in pH. Foaming will begin, indicating neutralization is in process. After the foaming subsides, test the pH of the residue.

If the pH of the residue falls within the range of 2.0 and 12.5, proceed with disposal of the material. If the pH of the residue is not within the range of 2.0 and 12.5, this indicates an acidic condition, carefully add water and additional neutralizer, mix thoroughly and test the pH of the residue again.

Pick up the neutralized spill material with the scoops and transfer to the plastic disposal bag provided with the spill kit. Wipe up any residual neutralized spill material with the sponge (moistened) provided.

Place used sponge, scoops and gloves in the disposal bag and seal the plastic disposal bag with the twist tie provided. Fill out the disposal label, peel off the adhesive backing and affix to the plastic disposal bag.

Dispose of the bag and contents in accordance with local environmental regulations.

Clean the surface where the spill occurred with soap and water.

Base/Caustic:

Ensure adequate ventilation and utilize the appropriate personal protective equipment.

Apply base neutralizer to the spill from the perimeter inward, applying sufficient neutralizer to obtain a uniform change in pH. Foaming will begin, indicating neutralization is in process. After the foaming subsides, test the pH of the residue. If the pH of the residue falls within the range of 2.0 and 12.5, proceed with disposal

of the material. If the pH of the residue is not within the range of 2.0 and 12.5, add more neutralizer, mix thoroughly and test the pH of the residue again.

Pick up the neutralized spill material with the scoops and transfer to the plastic disposal bag provided with the spill kit. Wipe up any residual neutralized spill material with the sponge (moistened) provided.

Place used sponge, scoops and gloves in the disposal bag and seal the plastic disposal bag with the twist tie provided. Fill out the disposal label, peel off the adhesive backing and affix to the plastic disposal bag.

Dispose of the bag and contents in accordance with local environmental regulations.

Clean the surface where the spill occurred with soap and water.

Toxic, flammable or volatile chemicals:

Attempt to determine the nature of the spill before entering the spill area.

If the liquid is flammable, immediately remove all sources of ignition from the spill area.

Immediately provide maximum ventilation.

If the toxic vapors are present, immediately notify laboratory staff to evacuate the area.

Wear appropriate protective equipment. Avoid excessive inhalation of vapor or contact with solvents.

Spill pillows will be used to absorb small spills. Large spills will be diked to prevent the spread of the spill.

Press the pillows into the spill and allow the absorptive action of the spill pillow to absorb the spill. Spills with large surface areas should be concentrated by using a squeegee to bring the fluid into contact with the absorbent pillows.

Place the saturated spill pillows in a hazardous chemical waste bag or metal container for temporary storage.

Dilute residue with appropriate liquids.

Scrub surface area of the spill area with soap and water.

DO NOT reuse spill pillows. Residue may remain and can react violently with

other chemicals.
Highly viscous fluids or liquids with a high surface tension can be brought under control more quickly by removing the absorbent material from the pillow. Pick up the saturated material with a scoop and transfer to a hazardous chemical waste bag or metal container for temporary storage.

Dispose of the bags and/or contents in accordance with local environmental regulations.

Biological spills:

Alert personnel in the immediate vicinity of the spill location.

Confine the spill by shutting doors and windows.

Evacuate the spill area, if necessary.

Summon assistance, if necessary.

Using the appropriate protective equipment, soak up the spill with cloth towels and other absorbing medium.

Disinfect the spill area with 10% bleach solution (1:10 mix with water).

Put cloth towels and other absorbing medium in airtight container and autoclave.

Discard the protective equipment.

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SAFETY MANUAL APPENDIX 7.2

CHEMICAL STORAGE – CHRIS SYSTEM

CHEMICAL STORAGE

THE "CHRIS" SYSTEM

1	Inorganic Acids	1																					
2	Organic Acids	x	2																				
3	Caustics	x	x	3																			
4	Amines & Alkanolamines	x	x		4																		
5	Halogenated Compounds	x		x	x	5																	
6	Alcohols, Glycol, & Glycol Ethers	x					6																
7	Aldehydes	x	x	x	x		x	7															
8	Ketones	x		x	x			x	8														
9	Saturated Hydrocarbons									9													
10	Aromatic Hydrocarbons	x									10												
11	Olefins	x				x						11											
12	Petroleum Oils												12										
13	Esters	x		x	x									13									
14	Monomers & Polymerizable Esters	x	x	x	x	x	x								14								
15	Phenols			x	x			x							x	15							
16	Alkylene Oxides	x	x	x	x		x	x							x	x	16						
17	Cyanohydrins	x	x	x	x	x		x									x	17					
18	Nitriles	x	x	x	x												x		18				
19	Ammonia	x	x					x	x						x	x	x	x	x	19			
20	Halogens			x			x	x	x	x	x	x	x	x	x	x				x	20		
21	Ethers	x													x						x	21	
22	Phosphorus, Elemental	x	x	x																	x		22
23	Acid Anhydrides	x		x	x		x	x							x		x	x	x	x			23

X REPRESENTS UNSAFE COMBINATIONS

How to read this chart:

For the chemical whose chemical compatibility you wish to check, start at the number (shown in blue) for that chemical on the right-hand side of the chart.

1. Check for X's in the columns (vertical), if any, to the left of that number. The number at the top of a column in which you find X's corresponds to an incompatible chemical.
2. Check for X's in the rows (horizontal), if any, below the number for the chemical in question. For each X that you find, an incompatible chemical is listed on the left-hand side of the row.

Examples:

1. Ketones (8) are incompatible with Inorganic Acids (1), Caustics (3), Amines & Alkanolaminies (4), Aldehydes (7), and also with Ammonia (19) and Halogens (20).
2. Olefins (11) are incompatible with Inorganic Acids (1), Halogenated Compounds (5), and also with Halogens (20).

Appendix 2
December 9, 2003

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SAFETY MANUAL APPENDIX 7.3

FENTANYL AND ANALOGS QUICK REFERENCE GUIDE

OK TO PURSUE WITH CARE	USE EXTREME CAUTION	CEASE IF INDICATED
3-allylfentanyl	4-phenylfentanyl	carfentanil
3-methylbutyrfentanyl	acrylfentanyl	lofentanil
benzylfentanyl	alpha-methylfentanyl	ohmefentanil
butyrfentanyl	beta-hydroxythiofentanyl	R-30490
fentanyl	crotonylfentanyl	cis-3-methylcarfentanil
n-methylcarfentanil	cyclopropylfentanyl	
ocfentanil	ocfentanil	
U-47700	remifentanil	
furanylfentanyl	sufentail	
acetylfentanyl	valerylfentanyl	
alfentanil	W-18	
	Alpha-methylthiofentanyl	
	Beta-hydroxyfentanyl	
	Beta-hydroxy-3-methylfentanyl	
	Beta-hydroxythiofentanyl	
	3-methylfentanyl	
	Methoxyacetyl fentanyl	

Substances classified as **GREEN** are OK to pursue with care **FOR DRUG CHEMISTRY**. These have the same or similar potency as fentanyl (based on reports of ED50 and opioid equivalency tables). These cases can be analyzed in other sections at the lab director or designee's discretion.

Substances classified as **YELLOW** are considered MORE potent than fentanyl and should only be pursued **FOR DRUG CHEMISTRY IDENTIFICATION** only if it is the only item/substance in a case or exhibit (no more than is necessary for weight class). These cases can be analyzed in other sections at the lab director or designee's discretion.

Substances classified as **RED** are to be considered extremely dangerous and are not to be pursued if/once an indication is reported. These cases will not be analyzed in other sections.

There is no way to make these lists all-inclusive. There are so many variations/analogs/metabolites/etc. that efforts to be all-inclusive would be futile.

If a substance is encountered that is NOT on this list, at a minimum it should be considered to be YELLOW.

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A. All users of lasers shall be expected to follow these guidelines, policy and procedures established as the Laser Safety Program.

1. Policy
Laboratories in general require precautions to limit associated hazards. Laboratories with high-powered (Class 3b and Class 4) lasers require special safety procedures to ensure a safe environment. It is the policy of the Forensic Sciences Command to provide its employees and visitors with the safest work environments possible; therefore, the Forensic Sciences Command requires conformance with these safety standards. In order to promote this policy, the Command shall provide the necessary materials and support needed to implement the safety and control measures required to ensure a safe environment.

2. Scope
This Program describes reasonable and necessary policies and a procedure for the safe use of lasers, which applies to all laboratories and employees who are associated in any manner with the use and/or handling of high-powered lasers.

The safety standards contained herein are based primarily on the American National Standards Institute Guide for the Safe Use of Lasers, standard ANSI Z136.1. This guide represents the generally accepted standards for the safe use of lasers within the fields of industry, education, research, and medicine.

B. Administration

Responsibility for the administration of the safety standards contained herein rests with the Laboratory Director. The Laboratory Director will designate a Laser Safety Officer (LaSO) who is responsible for the implementation of appropriate safety standards outline in ANSI Z136.1. The LaSO shall be an individual with the authority and responsibility to monitor and enforce the control of laser hazards, and to affect the knowledgeable evaluation and control of laser hazards noted in ANSI Z136.1. The LaSO shall not delegate the authority to approve a Laser Safety Plan, but may delegate such functions as evaluations, audits, and training.

C. Evaluation

The LaSO has the authority to suspend, restrict, or terminate the operation of a laser if, at any time, he/she determines that the laser hazard controls are inadequate. Once approval is obtained, the purchasing individual/unit is responsible for complying with the proper installation of the laser and maintenance of the required safety features. The LaSO is available for consultation and assistance with these requirements.

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Evaluation of laser safety and a laser acquisition is based on three primary considerations:

1) the laser classification,
2) the facility/environment where the laser will be used, and
3) the personnel operating or otherwise within the vicinity of the laser.

Changes to laser systems or new acquisitions must be reported to the Division of Nuclear Safety, Illinois Emergency Management Agency and properly registered.

D. Audits and Inspection

Existing laser safety plans will be routinely audited/reviewed, and the facility inspected. The frequency of audits and inspections will vary depending on risks that are identified. As a minimum, all laser safety plans will be audited/reviewed annually. Audits will be performed by the LaSO or as part of the annual Command audit by the Director of Quality Assurance. Documentation of all audits will be maintained.

E. Laser Hazards - Introduction

Lasers can present a variety of potentially serious hazards. Laser radiation can cause injury to the eyes and the skin. Lethal electrical and fire hazards can also be present with high-powered lasers. Hazardous chemicals may also be used in conjunction with lasers.

Each laboratory operating lasers or laser systems will document that the appropriate control measures are implemented to reduce the possibility of exposure to these hazards.

F. Eye and Skin Hazards

Hazardous effects can occur to various parts of the eye depending on the wavelength of the laser radiation. The injuries can vary due to the variance in how tissues absorb energy. The following are some examples of hazards that can affect the eye:

1. Radiation at the visible and near-infrared wavelengths is absorbed and can have hazardous effects on the retina.

2. Radiation at the near-ultraviolet middle infrared wavelengths is absorbed and can injure the lens.

3. Corneal absorption and associated effects can occur with far-infrared and middle-ultraviolet wavelengths.

4. Corneal lesions and retinal lesions can occur from the heat resulting from the energy absorption and from photochemical reactions.

5. Some transitional wavelength zones can result in both corneal and retinal damages.

G. Associated Hazards

Although less frequent, the potential for injuries resulting from skin exposure to a laser beam should be treated just as strictly as the potential for eye injuries. In certain situations where eye protection is worn, skin exposure could represent the more significant hazard.

Although eye and skin exposure to laser radiation represent the primary hazard associated with laser use, ancillary hazards associated with the use of lasers can be significant. Electrical shock, fire, injuries from cryogenics and chemicals are all potential hazards associated with laser use.

1. **Electrical Hazards:** Next to skin and eye exposure, electrical shock represents the highest potential for injuries from laser use, especially with the newer, high-powered lasers. The potential for electrical hazards most commonly results from inappropriate electrical installation, grounding, or handling of the high voltage associated with many lasers. Any laboratory responsible for the operation of any laser shall ensure the necessary protective electrical circuit design. The laser resonator and electro-optical elements should also be designed so that no exposed metallic element is above ground potential.

2. **Fire and Explosion Hazards:** High-pressure arc lamps, filament lamps, and associated optics can shatter or explode during laser operation. These components must be enclosed in housings that can withstand the maximum explosive pressures. The proper installation of the electrical power supply discussed in the above section is also important to reduce the potential for electrical fire.

3. **Other Associated Hazards:** Consideration should be given to other hazards that may be associated with laser use, including the presence of compressed gases, dyes, cryogenic liquids, toxic fumes and gases, ionizing radiation, and toxic materials. Consideration should also be given to the proper disposal of any hazardous materials in accordance with the appropriate Command policies.

H. Hazard Evaluation

Three primary elements influence the evaluation of laser hazards:

1. the laser or laser system,

2. the environment in which the laser is used, and

3. the personnel operating the laser or exposed to the laser hazards.

I. Applicable Standards

The standards from ANSI Z136.1 or Z136.3 will be applied as appropriate to evaluate potential eye and skin hazards. These standards set Maximum Permissible Exposure (MPE) levels for eye and skin exposure to laser radiation and the control measures required to prevent exposure.

J. Laser Classifications

All laser and laser systems are classified according to their accessible radiation during normal operation. Lasers should be appropriately labeled by the manufacturer in conformance with the Federal Laser Product Performance Standard. In most cases, this class label will determine the laser classification.

K. Applicable Standards

The standards from ANSI Z136.1 will be applied to classify lasers and evaluate the related hazards.

L. Engineering Safety and Control Measures

Based on the laser classification and the hazard evaluation, the LaSO will require certain safety and control measures. These may include engineering control measures incorporated into the laser or laser system, such as, but not limited to:

1. Protective housings
2. Access panels
3. Master switches
4. Viewing portals
5. Open or enclosed beam paths

M. Administrative and Procedural Control Measures

The LaSO may require certain administrative and procedural controls that may supplement and/or implement engineering control measures. These administrative and procedural controls include, but are not limited to:

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1. Standard operating procedures
2. Education and training
3. Authorized personnel requirements
4. Required alignment procedures
5. Required eye protection
6. The presence of any hazardous materials and their proper disposal
7. Ventilation systems

N. Other Special Control Measures

The LaSO will also consider special control measures that may be required as deemed necessary. These may include, but are not limited to:

1. Laser demonstrations involving the general public or exposure of the general public to any laser beam hazards.
2. Laser installation procedures
3. Federal, state, or local requirements
4. Personal protective equipment
5. Warning signs, labels, and signal words in accordance with the appropriate ANSI standards.
6. Electrical installations in compliance with the National Electrical Code (NEC).

O. Applicable Standards

▌Standards - the LaSO will apply the standards from ANSI Z136.1 to determine the appropriate safety and control measures.

P. Training

The laboratory must provide an adequate training program for the LaSO and to each employee routinely working with or around lasers above Class 3A. The level of training will be commensurate with the degree of potential laser hazards.

Training will be provided from available sources which may include, but are not limited to, the manufacturer's Guide and Operating Manuals, Safety Guide Literature, Video/Audio Programs, Laser Safety Orientation, review of materials on-line, participation in safety quizzes.

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A. Safety Training.

1. Training will be given during the year on a variety of safety topics. This may be accomplished by lectures, handouts, videos, drills, or any other means of providing the necessary information.

2. Documentation of such training will be maintained in a safety training log at each laboratory, with the training records maintained for a period of three years from the training date.

B. Annual Bloodborne Pathogen Plan (BBP) Training

An annual BBP training must be conducted with all employees. In addition to the BBP, the following information will also be included in the training:

1. Review of section SM-3 which addresses Hepatitis B vaccinations and titer testing;

2. Current information on Hepatitis B vaccinations taken from the Center for Disease Control (CDC) website;

3. Reminder that options are available through the employees' contractual (union) agreement.

B. Laboratory Security.

1. Each laboratory will have available to each employee procedures for operation of the laboratory security system.

2. Periodic checks of the security/fire alarms will be made and documented by maintaining a record of such checks.

C. Safety Drills.

1. General.

a. Because of the sensitive nature of some evidence, if a **DRILL** is announced, such evidence is to be secured before responding.

b. In some instances, ongoing analytical procedures may make it necessary for an analyst to remain at his workstation during a drill. If this is the case, the analyst should relay this information to a supervisor at the time of the drill. In the absence of a **CLEAR** understanding that a drill is in progress, respond as in an actual emergency.

c. Fire, tornado, bomb, and earthquake drills will be performed annually at a minimum.

D. Safety Inspections.

1. The laboratory safety officer, assisted by the laboratory safety committee, will conduct quarterly safety inspections utilizing criteria listed in SM 1 Appendix 1.1.

2. A record of the findings of each inspection plus any corrective/preventive measures taken are to be maintained in a file for audit purposes.

3. A higher-level inspection (Command, Division, ISO, etc.) may replace a quarterly inspection provided that safety measures/procedures are part of the inspection.

4. A record of all safety inspections will be maintained by the laboratory safety officer.

E. Safety Notification.

The Forensic Sciences Command Safety Program will periodically provide safety suggestions and/or bulletins to the Command laboratories via e-mail notifications. The notifications will be assigned a number, i.e., 97-SFTY-1, so that the laboratories can keep track of the notifications. The total number of notifications sent out during the previous year will be documented in the annual Quality Assurance Report so all Laboratory Directors may ensure that each laboratory is receiving them.

F. Safety Resources.

1. Safety Data Sheets (SDS)

a. OSHA regulations require chemical manufacturers and importers to supply customers with one SDS for each hazardous chemical they manufacture or import. SDS files for all hazardous laboratory chemicals are readily available to laboratory employees. Files are maintained by the laboratory safety officer.

b. As of September 2023, chemical manufacturers, distributors, and importers will be required to provide the SDS in the following, uniform format:

(1) Section 1, Identification - includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

(2) Section 2, Hazard(s) identification - includes all hazards regarding the chemical; required label elements.

(3) Section 3, Composition/information on ingredients - includes information on chemical ingredients; trade secret claims.

(4) Section 4, First-aid measures - includes important symptoms/ effects, acute, delayed; required treatment.

(5) Section 5, Fire-fighting measures - lists suitable extinguishing techniques, equipment; chemical hazards from fire.

(6) Section 6, Accidental release measures - lists emergency procedures; protective equipment; proper methods of containment and cleanup.

(7) Section 7, Handling and storage - lists precautions for safe handling and storage, including incompatibilities.

(8) Section 8, Exposure controls/personal protection lists - OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

(9) Section 9, Physical and chemical properties - lists the chemical's characteristics.

(10) Section 10, Stability and reactivity - lists chemical stability and possibility of hazardous reactions.

(11) Section 11, Toxicological information - includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

c. An SDS may be used for similar mixtures with essentially the same hazards and contents.

2. Library Books. Each laboratory will maintain a listing of safety books found in the laboratory's library.

3. Internet Safety-Related Resources. There are many, but some basic sites are:

- OSHA:
  www.osha.gov
- Oklahoma State University (has numerous links):
  ehs.okstate.edu

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- Centers for Disease Control:
  www.cdc.gov
- National Safety Council:
  www.nsc.org
- American Red Cross:
  www.redcross.org
- Laboratory Safety Institute:
  www.labsafety.org
- APHL - National Laboratory Training Network:
  www.aphl.org/training/Pages/default.aspx
- Illinois Department of Public Health
  https://dph.illinois.gov/contact-us.html
- Illinois Department of Labor
  https://labor.illinois.gov/contact.html
- Illinois Poison Center
  https://www.poison.org/contact-us

4. Safety Videos. Safety videos are available throughout the laboratory system and online. Laboratory safety officers are encouraged to collaborate in identifying useful videos that can be utilized with their respective staff.

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If any emergency procedure is implemented at the laboratory facility, laboratory management must report the incident to Forensic Sciences Command (FSC) Headquarters at the first opportunity.

A. Fire.

1. Fire extinguishers shall be available and readily accessible. Do not attempt to fight a fire unless it is small and controllable. When fighting a fire, never allow a fire to block your exit.

2. **Minor fires.** If extinguishable with no significant injury or damage, do so and report to the Laboratory Director. **ALL** fires must be reported.

3. **Major fires**, involving possible danger to personnel, either due to exposure to flammables or possible spread of fire.

   a. Notify the staff of fire's location. All personnel are to evacuate the building using posted evacuation routes.

   b. Notify the fire department.

   c. Supervisors or their designee will take sign-in sheets when exiting in order to verify that all persons have evacuated safely.

   d. Notify Command and the local District so that security/contingency plans may be established.

4. Report every fire occurring in an ISP-occupied facility to the Office of the State Fire Marshal, regardless of the type or magnitude. Written notification must be provided within 48 hours of the fire occurring in the facility. Also refer to ISP Directive ADM-113.

B. Tornado.

1. Each laboratory will designate safe areas for staff to go to in a tornado emergency. When such an emergency arises, all personnel in the laboratory will go to those locations.

C. Bomb Threat.

1. If a telephoned bomb threat is received, **try** to determine and record the following:

   a. Characteristics of the caller's voice, such as sex, age, accent, etc.

   b. Background noises.

c. When the alleged bomb is set to explode.

d. The exact location of the bomb.

e. The type and size of the bomb.

f. Why the individual wants to bomb the laboratory.

g. How the entry to the laboratory was gained.

h. Name of the person(s) and/or group who placed the bomb and their demands.

i. Note the time of the call.

2. The person who receives the call will notify laboratory management, who will call for the evacuation of the building and notify the Forensic Sciences Command. If laboratory management is not available, the person who receives the call should make the announcement for the evacuation of the building.

3. If a suspicious object is discovered when no announcement for evacuation has been made, call laboratory management and give whatever information is available.

   If safety is at all questionable, make an announcement for the evacuation of the building.

4. When evacuation of the building is ordered, leave the laboratory immediately using the emergency exit routes, and go to the assembly area used for fire drills.

5. The Laboratory Director will notify the local District, who in turn will notify the appropriate technical personnel.

6. Do not use a cellular phone to call for emergency services; the radio signal from the phone could detonate explosive devices.

D. Earthquake.

1. General.

   a. During an earthquake the earth moves like the deck of a ship. The movement of the earth is seldom the direct cause of death or injury. Most casualties result from falling objects and debris because the shocks will shake, damage, and demolish buildings. There will be no

advance warning preceding an earthquake.

b. If you are outdoors, stay outdoors; if indoors, stay indoors. During earthquakes, most injuries occur as people enter and leave buildings.

2. If you are indoors during an earthquake.

a. Take cover under a heavy desk, table, bench, or in doorways, halls, or against inside walls.

b. Do not use candles, matches, or other open flames either during or after a tremor because of the possibility of gas leaks. Extinguish all fires and pilot lights. Leaking gas from ruptured lines may cause a fire.

c. If you must leave the building, choose your exit carefully. Do not dash for exits as stairways may be broken and jammed with people. Never use elevators as power may fail.

3. If you are outdoors during an earthquake.

a. Move away from buildings and utility wires. The greatest danger is from falling debris just outside doorways and close to outer walls. Once in the open, stay there until the shaking stops.

b. If in a moving car, stop as quickly as safety permits, away from trees, poles, wires, and overpasses. Stay in the vehicle; a car may jiggle violently on its springs during an earthquake, but it is a good place to stay until the shaking stops. When you drive on, watch for hazards, created by the earthquake, such as fallen or falling objects, downed electrical wires, or broken or undermined roadways.

E. Chemical Explosions.

1. Evacuate the building.

2. If a person is injured.

a. Render first aid if possible and remove the victim from the area.

b. Obtain medical assistance, if necessary.

c. If possible, determine what chemicals were involved, and relay this information to medical personnel. Follow published safety procedures for handling the specific chemicals involved.

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d. Notify laboratory management as soon as possible.

F. Robbery and Theft.

1. In case of robbery during normal working hours.

   a. Cooperate; do not resist.

   b. Call police after the incident.

2. In case of a robbery outside normal working hours.

   a. Report the incident to the police.

   b. Do not handle any items; wait for the police to arrive.

   c. Notify laboratory management as soon as possible.

3. If at any time evidence or standard reference material is found to be missing, it should be brought to the attention of the Laboratory Director immediately.

Illinois State Police
Division of Forensic Services
Forensic Sciences Command

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Each laboratory will add any safety measures unique to their operation, such as their Bloodborne Pathogen Exposure Control Plan, Chemical Hygiene Plan, and/or specific evacuation procedures to the laboratory facility operations manual (FOM). No policy set forth in the FOM may supersede any requirements in the Command Safety Manual.