LABORATORY HEALTH AND SAFETY PLAN

7-20-20

Tuskegee University

Table of Contents

INTRODUCTION

Tuskegee University is committed to providing a safe and healthy work environment for its faculty, staff, and student researchers. Research laboratories at Tuskegee University operate under the auspices of the Division of Research and Sponsored Programs through the Office of Granstmanship and Compliance and the Biosafety Committee. Faculty, staff, and student researchers have the responsibility of ensuring that all activities within Tuskegee University involving potentially biohazardous materials are conducted in a safe manner and in conformity with federal mandated standards. Biohazardous material includes infectious biological agents, toxins (carcinogens, mutagens, and tetragons, and other hazardous chemicals), animal or human tissue or fluids, radioactive materials, and recombinant DNA. Infectious biological agents are viruses, bacteria, fungi, parasites and other organisms/genetic systems that, by virtue of their replication properties, are potentially harmful to humans and/ or other living systems. Compliance review is essential to all projects involving human subjects, vertebrate animals, carcinogens, recombinant DNA, biological and chemical hazardous material and proprietary materials.

Principal investigators and directors have an obligation to ensure that anyone using this facility are advised of the existence of any potential danger to their health and safety. Faculty, staff, and students have an obligation to report any safety issue immediately to their supervisor. New faculty, staff, and students must bet rained appropriately to work with biohazardous material within 90 days of hiring. This Laboratory Health and Safety Plan provides guidelines and protocol for faculty, staff and student researchers using this facility.

BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN

Regulation: 29 CFR 1910.1030
Scope: All employees not working in a healthcare facility with potential exposure to bloodborne pathogens, including all employees who are trained in first aid.

Policy Statement
It is the policy of Tuskegee University to eliminate or minimize occupational exposure to blood borne pathogens in accordance with federal and state regulations. The Blood borne Pathogens Exposure Control Plan (ECP) is a key document to assist our organization in implementing and ensuring compliance with the standard, thereby protecting our employees.

Plan Administration
The Table below provides the roles and contact information for the administration of the Blood borne Pathogens Exposure Control Plan.

Task	**Contact Person**	**Contact Information**	
ECP Administrator	*Wilbert Anderson Safety Officer/Security/*	727 - 8757	552-1299
Medical Surveillance and Recordkeeping	*Dr. Darnita Hill / Physician /Student Health* *Vernita Smart/ HR/ Benefits and compensation Manager*	724-8641 727-8510	
Training	*Wilbert Anderson Safety Officer/Security/*	727 - 8757	552-1299
Exposure Incident Reporting	*Wilbert Anderson Safety Officer/Security/*	727 - 8757	552-1299

ECP Administrator. The ECP Administrator is responsible for implementation of the ECP, and will maintain, review, and update the ECP at least annually, and whenever necessary, to include new or modified tasks and procedures and to reflect new or revised employee positions with occupational exposure. The Administrator will also prov727 - 8757ide and maintain all necessary personal protective equipment (PPE), engineering controls (e.g., sharps containers), labels, and red bags as required by regulation and company policies, and will ensure that adequate supplies and PPE are available in the appropriate sizes.

The principal investigator/instructor/director will be responsible for training, documentation of training, and making the written ECP available to employees and will act as the initial contact for reporting exposure incidents and ensure that the appropriate response is carried out.

Those employees determined to have occupational exposure to blood or other potentially infectious materials (OPIMs) will comply with the procedures and work practices outlined in this ECP.

Plan Review and Update

This ECP will be review and updated annually. When new hazards are introduced in the workplace or conditions change that would result in a change in occupational exposure by employees. ECP will be amended when it is determined that additional job classifications or tasks are likely to or may have occupational exposure to blood borne pathogens.

Definitions

- *Blood borne pathogens*-microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) which causes acquired immune deficiency syndrome (AIDS).
- *Exposure incident*-a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral (i.e., needle stick) contact with blood or other potentially infectious material that results from the performance of an employee's duties.
- *Other potentially infectious material (OPIM)*-bodily fluids visibly contaminated with blood, including saliva in dental procedures, semen, vaginal secretions, amniotic fluid, and other such material where it is difficult to differentiate between bodily fluids.
- *Personal protective equipment (PPE)*-protective covering for the head, eyes, hands, feet, and body, such as nitrile or other liquid-resistant gloves, a face mask, or an apron.
- *Sharp*-any sharp objects including needles, wood or metal splinters, nails, and broken glass, contaminated with blood or OPIM.

Employee Exposure Determination

The table below contains a list of all job classifications in which employees are likely to have occupational exposure to blood borne pathogens.

Likely Occupational Exposure-Job Classifications

Job Classification	Department/Work Area	Exposure Task/Procedure
First-Aid Provider	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

The table below contains a list of job classifications in which employees may at some time have occupational exposure, including part-time, temporary, contract, or per diem employees. The list includes tasks and procedures, or groups of closely related tasks and procedures, for which occupational exposure may occur for these individuals.

Possible Occupational Exposure-Job Classifications

Job Classification	Department/Work Area	Exposure Task/Procedure
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

If an employee believes that he or she may be occupationally exposed to blood borne pathogens and his or her job classification or tasks do not appear on the above lists, the employee should contact Name. Wilbert Anderson

ECP Implementation

Access to the ECP

Employees covered by blood borne pathogens rules and policies will receive an explanation of this ECP during their initial training session. It will also be reviewed in their annual refresher training.

All employees can review this Plan at any time during their work shifts by contacting Name. Wilbert Anderson A copy of the ECP will be provided free of charge to any employee who requests it.

Universal Precautions

All employees will use universal precautions in order to prevent contact with blood or OPIM during the administration of first aid, the removal of materials and waste from the first-aid station, clean up of any blood or OPIM, and housekeeping of any areas recently (i.e., same day) contaminated with blood or OPIM. All blood and OPIM will be considered infectious regardless of the perceived status of the source.

Engineering Controls and Work Practices

Engineering controls and work practices will be implemented to prevent or minimize exposure to blood borne pathogens. Name Mr. Wilbert Anderson Safety Officer Ph. #552-1299 is responsible for ensuring that the engineering controls and work practices are implemented and updated as necessary.

[Modify the following list of engineering controls or work practices as applicable to your facility; delete the options that do not apply.]

Engineering Controls/Work Practices/Housekeeping:

- Wash hands immediately after contact with blood or OPIM.
- If handwashing facilities are not immediately available after exposure, exposed employee(s) will be provided with an antiseptic cleanser with cloth or paper towels or antiseptic towelettes. Exposed employees will wash their hands with running water and soap as soon as possible after using the antiseptic alternatives.
- When skin or mucous membranes are exposed to blood or OPIM, those areas of the body will be washed or flushed with running water as soon as possible after contact.
- After removal of PPE used during exposure to blood or OPIM, the employee(s) will wash hands or other exposed skin areas with running water and soap as soon as possible.
- Wash hands immediately or as soon as feasible after removing gloves or other PPE.
- Remove PPE after it becomes contaminated and before leaving the work area.
- Place used PPE in [list appropriate containers for storage, laundering, decontamination, or disposal].
- Wear appropriate gloves when it is reasonably anticipated that there may be hand contact with blood or OPIM, and when handling or touching contaminated items or surfaces; replace gloves if torn, punctured or contaminated, or if their ability to function as a barrier is compromised.
- Utility gloves may be decontaminated for reuse if their integrity is not compromised; discard utility gloves if they show signs of cracking, peeling, tearing, puncturing, or deterioration.
- Wear appropriate face and eye protection when splashes, sprays, spatters, or droplets of blood or OPIM pose a hazard to the eyes, nose, or mouth.
- Remove immediately or as soon as possible any garment contaminated by blood or OPIM, in such a way as to avoid contact with the outer surface.

Name Mr.Wilbert Anderson Ph. # 552-1299 evaluates new exposure control procedures and new products regularly by [describe the process, such as literature reviewed, supplier info, products considered].

PPE

All PPE is provided to employees at no cost to them. PPE will be chosen based on the anticipated exposure to blood or OPIM. The PPE will be considered appropriate only if it does not permit blood or OPIM to pass through or reach the employee's clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which it will be used.

The table below describes in detail how PPE will be provided and the types of PPE that will be given to employees.

Provision of PPE to Employees

How Provided	PPE Distributor	Procedures Requiring PPE	Type of PPE Required
Gloves place in labs	Lab PI	Cell cultures	Gloves and coats, cell culture hoods
Lab coats given out	Lab PI	Lab work involving chemicals	Fume hoods and gloves

Goggles provided	Lab PI	Lab work involving chemicals	Fume hoods gloves lab
When required by PI			coats
Fume hoods built in	labs		Goggles

All PPE will be cleaned, laundered, and disposed of by the employer at no cost to employees.
All repairs and replacements will be made by the employer at no cost to employees.
All PPE will be removed prior to leaving the work area. If visibly contaminated, PPE will be placed in an appropriately designated area or container for storage, washing, decontamination or disposal. The designated areas are: *[List designated disposal, storage, washing, or decontamination area(s).]*

Blood- or OPIM-contaminated PPE
If PPE or personal clothing is splashed or soaked with blood or OPIM, the person wearing the PPE or clothing will remove the contaminated clothing as soon as possible. This clothing will be laundered at the employer's expense. The clothing would be identified as contaminated and any employee exposed to it would be notified and protected from exposure.

Gloves
Gloves will be worn where it is reasonably anticipated that employees will have hand contact with blood, other potentially infectious materials, no intact skin, and mucous membranes. Gloves will be available . Gloves are place in all Labs
Disposable gloves will not be washed or decontaminated for re-use and will be replaced when they are torn, punctured, or when their ability to function as a barrier is compromised. Utility gloves may be decontaminated for re-use provided that the integrity of the glove is not compromised. Utility gloves will be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration, or when their ability to function as a barrier is compromised.

PPE Training
All employees covered under the requirements of this Plan will be trained to properly use, put on, take off, decontaminate, maintain, and store PPE. Training in the use of the appropriate PPE is provided by Name. Mr. Wilbert Anderson Safety Officer Ph. #552-1299

Housekeeping
Areas where an incident involving blood or OPIM exposure occurs will be cleaned and decontaminated as soon as possible after the incident.

Decontamination of work areas will be accomplished by using the following materials:
- 10% bleach solution
- Other germicide supplied in all labs by the Lab PI

All contaminated work surfaces will be decontaminated after completion of procedures and immediately or as soon as possible after any spill of blood or OPIM, as well as the end of the work shift if the surface may have become contaminated since the last cleaning.
Broken glassware that may be contaminated is only picked up using mechanical means, such as a brush and dustpan.

Exposure Incident Report

Any incident that results I n occupational exposure to blood or OPIM will be reported immediately (no later than the end of the work shift) to principal investigator or supervisor. The report will include the names of all first-aid providers who rendered assistance, and the time and date of the incident. The report will include a determination of whether an exposure has occurred. If so, a post-exposure evaluation will be performed. A report that lists all first-aid incidents will be readily available to employees who request it.

Employee Training

All employees who have occupational exposure to blood borne pathogens and OPIM will receive initial by the principal investigator/instructor/director and annual training conducted by the Office of Environmental Safety. All employees who have occupational exposure to blood borne pathogens and OPIM will receive training on the epidemiology, symptoms, and transmission of blood borne pathogen diseases. In addition, the training program covers, at a minimum, the following elements:

- A copy and explanation of the OSHA blood borne pathogen standard
- An explanation of our ECP and how to obtain a copy
- An explanation of methods to recognize tasks and other activities that may involve exposure to blood and OPIM, including what constitutes an exposure incident
- An explanation of the use and limitations of engineering controls, work practices, and PPE
- An explanation of the types, uses, location, removal, handling, decontamination, and disposal of PPE
- An explanation of the basis for PPE selection
- Information on the appropriate actions to take and persons to contact in an emergency involving blood or OPIM
- An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available
- Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident
- An explanation of the signs and labels and/or color coding required by the standard and used at this facility
- An opportunity for interactive questions and answers with the person conducting the training session

Training materials for this facility are available at the Office of Environmental Safety.

Recordkeeping

Training Records

Training records

Are completed for each employee upon completion of training. These documents will be kept for at least 3 years in the laboratory and the Office of Environmental Safety.

Training records will include the:

- Dates of the training sessions
- Contents or a summary of the training sessions

• Names and qualifications of persons conducting the training
• Names and job titles of all persons attending the training sessions

Employee training records will be provided upon request to the employee or the employee's authorized representative within 15 working days. Such requests should be addressed to Mr. Wilbert Anderson

Environmental Safety Officer.

Medical Records

Medical records are maintained for each employee with occupational exposure in accordance with the employee exposure and medical records regulation. The Environmental Safety Officer is responsible for maintenance of the required medical records. These confidential records are kept in 301 Kresge Center for at least the duration of employment plus 30 years.

Employee medical records are provided upon request of the employee or to anyone having written consent of the employee within 15 working days. Such requests should be sent to: Mr. Wilbert Anderson

,

Kresge Center, Tuskegee, Alabama 36088

OSHA Recordkeeping

An exposure incident will be evaluated to determine if the case meets OSHA's record keeping requirements (29 CFR 1904). This determination and the recording activities are done by the Environmental Safety Officer.

Plan last updated: Date7-20-2020

BLOODBORNE PATHOGENS EXPOSURE INCIDENT REPORT

Employee Instructions

You are completing this form because you have experienced an actual or a potential exposure to blood or other potentially infectious material. An evaluation of this exposure is required by egulation.

Please complete all the information below. Take this form with you when you go to a physician or other healthcare provider for the evaluation of the exposure. The information contained on this form is crucial to a proper evaluation of the exposure. Please take the time and care in completing the form to insure that the information is clear and accurate. If you need information on where to have this medical evaluation performed, please contact your supervisor. The medical evaluation for a suspected exposure to blood or other potentially infectious material should be done *as soon as possible* after the exposure. The effectiveness of certain vaccines or other medication which might prevent any illness resulting from these exposures is greatest if given shortly after the exposure.

Complete the appropriate accident report for your supervisor.

Employee's Statement: (Please Print)

Name: _____
Job Title: _____
Work Location: _____
Work Phone: _____
Supervisor: _____
Description of Exposure Incident
Date: _____
Time: _____ am / pm
City/Town: _____
State: _____
Describe Incident (Please include the type of infectious material to which you were exposed and the circumstances of the exposure):

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Supervisor's Statement: (Please Print)
Employee's Name: _____
Supervisor Identification.
Name: _____
Work Phone: _____
Description of Incident
(Please describe the employee's duties as they relate to the exposure incident):
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Investigation of Source
Please describe what information is known about the source of the exposure (the person's name, address, telephone number, or other contact point), the result(s) of the blood testing of the source person (if known), or why blood testing of the source person is not feasible. Also, if the source person is known to have or test positive for hepatitis B or human immunodeficiency virus (HIV), please indicate this fact. The source person must be tested for these agents unless such testing is not legally possible.
_____

EYE AND FACE PROTECTION PLAN

Authority and Scope

Regulation: 29 CFR 1910.132 and 29 CFR 1910.133 (Eye and Face Protection).

Scope: This plan addresses the protection of the eyes and face of all employees, visitors, contractors, and others passing through an eye/face hazard area.

Policy Statement

Tuskegee University is dedicated to protecting the safety and health of its employees. The company will provide protective eyewear and/or protective face shields to employees working in areas or performing tasks that present a potential for eye or face injury. The protective devices will be used in conjunction with machine and equipment protective devices, engineering controls, compliance with equipment and tool manufacturer specifications, and safe work practices.

Plan Administration

The table below provides the contact information for the administration of the eye and face protection program.

Plan Administrator. The Plan Administrator will:

- Evaluate operations and work areas to determine personal protective equipment (PPE) requirements.
- Recommend PPE that conforms to applicable standards (e.g., American National Standards Institute (ANSI), National Institute for Occupational Safety and Health (NIOSH)).
- Maintain records of hazard assessments performed to identify PPE requirements.
- Provide information and training on PPE, including requirements, use, limitations, proper care, maintenance, useful life, and disposal.

Supervisor(s). Supervisors will ensure that:

- Eye and face PPE is readily available to employees working in areas or performing operations that require PPE for protection.
- Enforce the use of PPE when required to protect employee health and safety.
- Ensure PPE is properly stored and maintained.

Employees. Employees that wear eye or face PPE will use, maintain, and s tore it in accordance with the procedures and instructions provided by the supervisor or Administrator, and will not use damaged or defective PPE. Employees will report all problems associated with PPE (i.e., damage, worn, or inadequate) to their supervisor.

Plan Review and Update

This Plan will be reviewed and updated whenever:

- New hazards are Identified.
- Operations at the facility change that require a revision to this Plan.

• An accident investigation or safety audit warrants a Plan revision.

Definitions

- *Eye protection equipment*--Devices that protect the user from injury to the eyes, including safety glasses, chemical splash goggles, face shields, welding goggles, and welding face shields.
- *Safety goggles/glasses*--Prescription or nonprescription lenses in frames
- *Eye hazard operations*--Tasks that present a potential eye injury hazard. Eye protection should be worn during eye hazard operations, such as pouring or transferring hazardous liquids, grinding, and when using impact or power tools.
- *Eye/face hazard area*--Work areas identified in the Hazard Assessment as high risk for eye or face injuries.

Hazard Assessment

The principal investigator/director/instructor will conduct a hazard assessment for each work task and operation at the facility. Following is the process for evaluating the operations and tasks that present a potential eye or face injury hazard:

1. Conduct a survey of each work area to assess if hazards are present, or are likely to be present, for which the use of eye or face PPE is needed. The Administrator will also provide worksite evaluations of any operation at the request of a supervisor or employee.
2. Review injury and illness records, the layout of the work areas, and the placement of workers in the work areas.
3. Collect and organize the data for each work area, and estimate the potential for injuries according to the basic hazard categories and potential sources of injury and illness.
4. Determine the type, level of risk, and seriousness of potential injury from each of the hazards found in the work areas, and evaluate the possibility of exposure to several hazards.
5. Categorize and record the hazards.
6. Determine what type of PPE will protect against the hazards that are found.
7. Incorporate the results of the assessment and recommendations for protection into the PPE plan.

The table below contains the hazard categories and sources for work areas that will be surveyed at the facility.

Hazard Assessment Categories
[Modify the contents of the table as applicable to your facility and work areas.]

Categories of Hazards	**Sources of Injury or Illness**
Penetration	Sharp objects that could pierce the eye or face.
Impact or Compression	Motion; i.e., machinery or processes where any movement of tools, machine elements, or particles could exist, or movement of personnel that could result in collision with stationary objects. Falling objects or potential for dropping

	objects.
Chemical	Exposures to corrosive, acidic, caustic, toxic, flammable, explosive, reactive, or carcinogenic chemicals in liquid, vapor, or gas form. Specific sources of exposure include aerosol cans, molten metal, cleaning solutions, solvents for cleaning metal, spray adhesive, and spray paints that might be splashed or sprayed into a worker's face or eyes.
Heat	High temperatures from furnaces, hot equipment, molten metal, pipes, heat vents, and other sources that could result in burns, eye injury, or ignition of protective equipment.
Harmful dust	Operations that produce harmful dusts.
Light (optical) radiation	Welding, brazing, and cutting, and heat treating operations; furnaces; high intensity lights.
Pathogens	Blood or other body fluids.
Electrical	Electrical panels, wires, conduits, and electrical equipment that can shock or electrocute.
Other	N/A

Reassessment of hazards. The Administrator will periodically reassess the workplace hazard situation by identifying and evaluating new equipment and processes, reviewing accident records, and reevaluating the suitability of previously selected PPE.

PPE Supplies

Supervisors of eye/face hazard areas will acquire and maintain an adequate supply of PPE for each eye/face hazard area that will provide the maximum amount of protection possible. If personnel in such areas wear personal glasses, they will be provided with a suitable eye protector to wear over them.

Protective Eyewear and Face Shield Guidelines

The following general eyewear guidelines will be followed by supervisors and employees in all eye / face hazard areas:

- Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment.
- Side protectors will be used on glasses or spectacles when there is a hazard from flying objects.
- Goggles and/or face shields will be used when there is a hazard from chemical splashes.
- Face shields will only be worn over primary eye protection (safety glasses or goggles).
- Eye protection must not interfere with the function of other required PPE.
- Eye protection must not restrict vision or movement.
- Eye protection will
- be cleaned and disinfected after each shift.
- Equipment fitted with appropriate filter lenses will be used to protect against light radiation. Tinted and shaded lenses are not considered filter lenses unless they are marked or identified as such.

- Eye and face PPE must be distinctly marked with the manufacturer's identification.

Prescription Safety Eyewear
Any employee who wears prescription lenses while engaged in operations that involve eye hazards will wear eye protection that incorporates the prescription in its design, or will wear eye protection that can be worn over the prescription lenses (e.g., goggles or face shields) without disturbing the proper position of the prescription lenses or the protective lenses.

Emergency Eyewash Facilities
Emergency eyewash facilities meeting the requirements of ANSI Z358.1 will be provided in all areas where the eyes of any employee may be exposed to corrosive materials. All such emergency facilities will be located where they are easily accessible in an emergency.

EMPLOYEE TRAINING
The Administrator will provide training to each employee who is required to use eye or face PPE.
Each employee will be trained to know at least the following:

- When PPE is necessary
- What PPE is necessary?
- How to properly put on, take off, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life, and disposal of PPE

When the Administrator has a reason to believe that any affected employee, who has already been trained does not have the understanding and skills required to use the PPE, the Administrator will retrain such employee. Circumstances where retraining is required include:

- Changes in the workplace render the previous training obsolete; or
- Changes in the types of PPE to be used that render previous training obsolete; or
- Inadequacies in an affected employee's knowledge or usage of the PPE.

Recordkeeping
Records of eye and face protection training (dates, employee attendance, and name of trainer) will be kept Location Safety officers files for five years.

Plan last updated: Date 7-20-20

COMPRESSED GAS SAFETY PLAN

Authority and Scope
Regulation: 29 CFR 1910.101

Policy Statement
It is the policy of Tuskegee University that all compressed gases will be handled, stored, received, and used in a safe manner consistent with the requirements of the Compressed Gas Safety Plan, and to ensure that employees handling compressed gases are adequately trained in the inherent hazards of the cylinders and their contents, as well as proper handling, storage, and use according to all federal and state regulations.

Plan Administration
The table below provides the roles and contact information for the administration of the Compressed Gas Safety Plan.

Program Contact Information

Task	Contact Person	Contact Information
Plan Administrator	Wilbert Anderson	Work # 727-8757 Cell#552-1299
Hazard Assessment Administrator	Wilbert Anderson	Work # 727-8757 Cell#552-1299
Employee Trainer	Wilbert Anderson	Work # 727-8757 Cell#552-1299

Plan Administrator. The Plan Administrator (Principal Investigator/Instructor/Director) is responsible for developing and maintaining this written Compressed Gas Tank Safety Plan. The Plan Administrator is qualified to administer and oversee the Plan, ensure that the required evaluations are conducted, and ensure that all affected employees receive the appropriate training required in this Plan. The Plan Administrator is also responsible for planning and conducting hazard assessments and administering the training requirements for compressed gas safety as outlined in this Plan for all employees who work with or around compressed gas cylinders and equipment. The plan administrator will submit hazard assessments to the Environmental and Safety Officer

Plan Review and Update
This Plan will be reviewed and updated:

- Annually
- Whenever there is a change in federal or state regulations related to compressed gas
- Whenever there is a change in facility operations related to the use, handling, or storage of compressed gas containers or equipment

Definitions

Storage--removal of an object from regular use for an appreciable period of time. Placing an object aside for a short while with the intent of using it again would not constitute storage of the object.

Hazard Assessment

The hazards of compressed gases fall into one or more of the following general categories:

- Fire
- Explosion
- Release of toxic gases

A hazard assessment is required for all processes or equipment involving the use of hazardous gases, and include: *[Modify the following list as applicable to your facility.]*

- All pressure vessel systems that contain oxygen or irritant, toxic, infectious, flammable, and/or radioactive materials at any pressure.
- All pressurized equipment (including ASME-coded vessels that have been structurally modified) that operates at gas pressures over 150 lbs per square in. gauge (psig) or at liquid pressures over 1,500 psig, or that contains over 75,000 foot-pounds (ft-lb) of stored energy.
- Confined or oxygen-deficient space.

Labels on the cylinders and material safety data sheet (MSDS) will be consulted as part of the overall hazard assessment.

Following are several common causes of injury from compressed gas hazards:

- Exposure to the release of toxic substances
- Being struck by an object due to a pressure release or explosion
- Fire
- Asphyxiation
- Strains from moving cylinders
- Being stung by wasps or bees nesting in cylinder caps

Inspection

The Environmental Safety Officer is qualified to determine that compressed gas cylinders are in a safe condition to the extent that can be determined by visual inspection. Inspections of cylinders will be conducted annually.

Identification

Each gas cylinder will be marked with its identity; the marking will be matched with the appropriate MSDS in order to identify specific hazards and protections. Compressed gas cylinders must be marked with the name of the compressed gas, and have a label indicating the hazards of the compressed gas. Cylinders that are transported between the vendor and the facility will have Department of Transportation (DOT) labels. Labels or markings must never be removed from a cylinder or bulk storage system. Empty cylinders will be identified with the letters “MT”.

Bulk Tanks and Pipes

The National Fire Protection Association (NFPA) has labeling requirements for bulk tanks. The colored diamond-shaped labels indicate the different types of hazards:

- Blue = health hazard
- Yellow = instability hazard (formerly reactivity)
- Red = fire hazard

Make sure the tank and all the associated piping are properly label. You should be able to look at the pipe anywhere along the system and know what gas it contains. All user pipes should also be labeled so that the user knows what gas is being hooked up.

Safe Work Practices

General Use and Handling Practices

Compressed gas cylinders will be handled in accordance with [ANSI Z49.1, CGA P-1-(latest version) Safe Handling of Compressed Gases in Containers, or other consensus standards]. Employees who work with or around hazardous gas or compressed gas cylinders will comply with the following general safe work practices:

- Do not mix gases in a cylinder.
- Do not refill a cylinder.
- Do not smoke around compressed gas cylinders.
- Only accept and use DOT-approved cylinders.
- Never drop a cylinder.
- Connections to piping, regulators, and other appliances will be tight to prevent leakage. If a leak is suspected, a gas detection fluid, soapy water, or other commercially available solution will be used for leak detection.
- Release of gas pressure within a pressurized system will be done before removal of appliances, hoses, or regulators.
- Protect cylinders from cuts , abrasions that might be caused by banging into equipment or machinery.
- Never use a cylinder for any purpose other than its intended function of containing a compressed gas. Do not use the cylinder as a roller or some sort of support, such as a sawhorse.
- Each cylinder bearing a DOT specification marking must be inspected, retested, and marked in conformance with 49 CFR 173.34, “Qualifications, Maintenance and Use of Cylinders.”
- Keep cylinders upright and secure to prevent them from being knocked over.
- Never tamper with cylinder safety devices. You are putting yourself and others in danger.
- Keep the cylinders away from operations that create sparks, heat, and fire, as well as electrical circuits.
- Don’t use oil or grease on the cylinders or handle them with oily hands or gloves.
- When welding nearby, protect the cylinders with heat-resistant blankets or tarps.
- Don’t let oxygen spray on an oily or greasy surface or on your clothes.
- Don’t use cylinders in unventilated areas.
- Keep cylinders secured upright.
- Open valves by hand, not with a wrench or other tool.
- Don’t tamper with safety devices.

- Open, then close, valves quickly. Open valves slowly, standing to the side, rather than standing in front of the outlet.

Cylinder valves. When working with cylinder valves:

- Valves with wheels will be opened slowly by hand and pointed away from persons or sources of ignition. On valves without wheels, only non-sparking wrenches provided by or recommended by the supplier will be used. If the valve requires a tool, do not use the cylinder; too much stress on the valve will cause it to break off.
- If a cylinder leaks, close the valve, take it outside, away from any ignition sources, empty it, and mark it "MT". Be sure a person trained and equipped for firefighting is with you. Don't try to fix a cylinder leak, valve, or any other problem. Tag leaking cylinders as such and state that they will be kept away from heat.
- Never tamper with a cylinder's safety valves.
- Keep the valve stem caps on when cylinders are not in use.
- Open the valve slowly with your hand to the side, not above, the valve. Opening the valve quickly might put undue pressure on the regulator or other systems. Serious injury could occur if the valve was to fail when your hand is above it. Turn the valve with your hand to the side, because the valve handle could become a projectile if the valve was to fail.

Moving a cylinder. When moving a cylinder:

- Always make sure the valve is closed and the cap is on. This means that the cylinder must be detached from any equipment, and the regulator must be removed.
- Do not walk a cylinder (i.e., rock it back and forth or roll it along the bottom edge) while holding onto the valve cap. The cap could come loose, causing you to drop the cylinder, and the exposed valve could be knocked off. Now your cylinder has been converted into a rocket.
- Never roll a cylinder on its side. Not only could this damage the cylinder, but it also exposes the valve and cap to the hazard of striking a solid object while the cylinder is rolling.
- Use a hand truck that has a proper securing system such as a chain.
- *Regulators and Gauges*
- Following are guidelines for using regulators and gauges:
    - Every regulator and gauge must be rated for the pressure that will be applied from the gas system. Do not use a low-pressure regulator/gauge on a high-pressure gas system.
    - Before installing the regulator, make sure it is compatible with the gas; exchanging a gauge from one gas to another could cause a dangerous reaction. The thread sealant must be approved for the application. The wrong sealant may react with the gas.
    - Wear eye protection whenever operating a regulator or gauge. Although very rare, the regulator or gauge could fail.

Oxygen

Oxygen containers will be separated from flammable gas containers or combustible materials a minimum of 20 ft or by a noncombustible barrier at least 5 ft high having a fire resistance rating of at least one-half hour. Bulk oxygen storage systems will be located above ground and outdoors, or will be installed in a building of noncombustible construction, adequately vented, and used for that purpose only.

Acetylene

In-plant transfer, storage, and utilization of acetylene cylinders will be in accordance with Compressed Gas Association Pamphlet G-1, Acetylene, Latest Year 2020.
Acetylene tanks will be transported, stored, and utilized only in an upright position.
Only regulators designed for acetylene gases will be used on acetylene tanks.
Storage near oxidizers is prohibited.

Liquified Petroleum Gas (LPG)

Storage of LPG within buildings is prohibited. When stored outside of buildings, containers awaiting use will be located away from the nearest building or group of buildings, in accordance with the information below.

LPG Storage Distances from Buildings

Quantity of LP-Gas Stored	Distance (feet)
500 lbs. or less	0
501 to 6,000 lbs	10
6,001 to 10,000 lbs	20
Over 10,000 lbs	25

LPG containers will be stored in a suitably ventilated enclosure or otherwise protected against tampering. Storage locations will be provided with at least one approved portable fire extinguisher having a rating of not less than 20-B:C.

Hydrogen

Hydrogen containers will comply with the DOT specifications or ASME Boiler and Pressure Vessel Code, Section VIII. Each container will be marked with the name “Hydrogen.”
Only spark-proof tools will be used in and around hydrogen environment. Hydrogen storage areas will be permanently labeled as follows: “DANGER HYDROGEN-NO SMOKING” (ASN P810-3). Bottled hydrogen cylinders will be kept within the storage room. Hydrogen systems will be located so that they are readily accessible to delivery equipment and to authorized personnel. Manifold systems will not be used with compressed hydrogen. A limited number of hydrogen cylinders may be stored on site. This should be limited to 15 cylinders (or no more than 3,000 cu ft of hydrogen). Any exception to this must be approved by the Environmental and Safety Officer.

Carbon Dioxide

Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Nitrous Oxide
Store in well ventilated areas. Store in well ventilated areas away from combustibles. Keep valve protection cap on cylinders when not in use. Keep nitrous oxide cylinders locked up when not in use. Limit access to the nitrous oxide to those people that work with it regularly.

Leaking Cylinders
Never try to repair a compressed gas cylinder. Tag the cylinder with information that warns others the cylinder is leaking and must not be used, move it outdoors if safe to do so, and keep it away from heat or flame. You may also need to secure the area to prevent people from getting too close to the leaking gas and to prevent people from smoking near the cylinder. Contact the manufacturer or local cylinder dealer for advice on how to handle the leaking cylinder. Consult the MSDS if necessary. Contact the Environmental and safety Officer to report leaking cylinder.

Cylinder Storage
Following is a list of safe practices for storing compressed gas cylinders that will be followed in all work areas:

- Adequate, portable fire extinguishers of carbon dioxide or dry chemical types will be available for fire emergencies at storage areas.
- Contents of any compressed gas cylinder must be identified and labeled properly. Visual inspection is important to ensure that they are in good and safe conditions.
- Oxygen cylinders must be stored in a dry, well-ventilated area and 20 ft away from combustible materials, and away from any heat source or electrical wiring.
- Where storage 20 ft away from combustibles, heat sources, or electrical wiring is impractical, gas cylinders will be separated from such sources by a 5-ft-tall, 1/2-hour rated fire wall.
- Keep cylinders away from stairs and elevators.
- Cylinders will be stored on a level, fireproof floor in a place where they won't be banged or knocked over.
- Cylinders will be secured upright by chain, cable, or similar restraint.
- Leaking cylinders must be reported and moved to a safe place.
- When cylinders are in storage, valves will be closed and valve protection caps will be screwed down to the last thread.
- The storage area will be organized so that users will withdraw the cylinders that have been in there longest. The newest ones received will be placed behind those already in storage.
- Keep combustibles (i.e., wood, paper, cardboard) away from the storage area. Remove any heat sources such as machinery or welding practices. Do not allow a cylinder to become part of an electrical current.
- Do not store cylinders in elevators, staircases, hallways, etc., where people are often traveling. This will increase the risk of knocking over a cylinder.
- Store cylinders in an upright position.
- Secure cylinders with straps, chains, cords, or other ways to prevent them from tipping or falling over.
- Make sure cylinders are stored with the valve cap on.

- Sparks, open flames, and smoking are not allowed near cylinder storage areas.
- Periodic surveillance of cylinders in storage areas must be done. Deficiencies discovered must be corrected immediately.
- Use hands to open and close valves; in case there is a difficulty in opening a valve, contact the supplier or vendor.
- Do not refill an empty cylinder.
- Never smoke in the vicinity of compressed gas cylinders.
- Cylinders must not be dropped or allowed to fall.
- Do not store cylinders in direct sunlight.

Signs.
Container storage areas will be prominently posted with the hazard class or name of the gases stored. Most storage areas will have "No Smoking" signs along with general "Danger," "Caution," or "Warning" signs.

Transporting Cylinders
When transporting cylinders by hoist or forklift, use appropriate baskets or cradles that secure the cylinder and prevent it from banging around or falling. Never use a sling or an electromagnet to lift or hoist a cylinder. Cylinders could easily fall out of a sling, and electromagnets could fail or otherwise release a cylinder. Never lift a cylinder by the cap; valve caps are not made to carry the weight of a cylinder. Do not move transport the cylinder to another location unless approved by the Environmental and safety Officer.

Personal Protective Equipment (PPE)
The principal investigator/instructor/director has assessed the hazards associated with the compressed gases and equipment and appropriate measures have been taken to eliminate or reduce their presence with engineering and administrative controls. Where these controls are not enough for employee protection, Tuskegee University will provide all necessary PPE according to the PPE program. Shatterproof safety goggles will be used whenever any connection is made or broken to a compressed gas cylinder or valve. Fabric or leather work gloves will be worn whenever a compressed gas cylinder is moved or transported.

Emergency Procedures
This facility has adopted an Emergency Action Plan (EAP) for procedures and assignments during an emergency. See attachment.

Training
All employees who use, handle, store, or transport hazardous gases will be trained in the inherent hazards of the cylinders and their contents, as well as proper handling, storage, and use of compressed gas containers before they begin work with or around such gases.
The training program will include the following elements:

- How to recognize a compressed gas and its container.
- How to safely handle, store, and use compressed gas cylinders.
- The labeling requirements of compressed gases.
- The specific hazards of different types of compressed gases.

Refresher Training
Refresher compressed gas training will be provided to employees who work with or near compressed gas whenever there is a change in facility operations that affect the use, handling, storage, or transport of compressed gas. It will also be provided to any employee who demonstrates a deficiency in using, handling, storing, or transporting compressed gas.

Training Records
Training records will be maintained that show when the training was held, what was covered, who gave the training and the trainer's qualifications, and who attended. Such records will be kept in the laboratory and a copy submitted to the Environmental and Safety Officer.

Recordkeeping
The principal investigator/ instructor/director will maintain a written log of each compressed gas or pressurized equipment modification, repair, test, calibration, or maintenance service, including the date and nature of work performed serial number of the item, and the name of the person performing the work. Copies will be submitted to the Environmental and Safety Officer.

References
Following is a list of references incorporated as a whole or in part into this Plan. These references can provide additional explanation or guidance for the implementation of this Plan.

- American National Standards Institute, ANSI 248.1-1954, Marking Portable Compressed Gas Containers to Identify the Material Contained
- ANSI B31.1-1967, Industrial Gas and Air Piping
- ANSI UL 407-1995, Standards for Safety Manifolds for Compressed Gases
- American Society of Mechanical Engineers, ASME Boiler and Pressure Vessel Code, Section VIII
- OSHA, 29 CFR 1910.101, Compressed Gases (general requirements)
- OSHA, 29 CFR 1910.102, Acetylene
- OSHA, 29 CFR 1910.103, Hydrogen
- OSHA, 29 CFR 1910.104, Oxygen
- OSHA, 29 CFR 1910.253, Oxygen-Fuel Gas Welding and Cutting
- OSHA, 29 CFR 1910, Subpart M, Compressed Gases and Compressed Air Equipment
- OSHA, 29 CFR 1910, Subpart S, Electrical
- OSHA, 29 CFR 1926.153, Liquified Petroleum Gases
- DOT, 49 CFR 173.34 Qualifications, Maintenance and Use of Cylinders

Compressed Gas Cylinder Storage Areas

Location	Gas Type	Average # of Cylinders	Inspection Date
Carver	CO2	8	7-20-20
Carver	Liquid Nitrogen	1	7-20-20
Carver	Liquid CO2	4	7-20-20
Bowie Hall	Liquid CO2	4	7-20-20

Bowie Hall	Liquid Nitrogen	1	7-20-20
Bowie Hall	CO2	8	7-20-20

Plan last updated: Date 7-20-20

FIRE PREVENTION PLAN

Policy Statement

Tuskegee University will provide its employees and other personnel with a clear plan to prevent the loss of life and property by fire. The plan will comply with applicable fire prevention regulations.

Authority and Scope

Regulation: 29 CFR 1910.39, Fire Prevention Plans

Scope: This plan covers all work operations at Tuskegee University where fire hazards or the potential for fires may be present. This FPP provides all facility personnel with basic information about major fire hazards and fire prevention methods in accordance with federal and state regulations and company policy.

Plan Administration

The table below provides the roles and contact information for the administration of the FPP.

Plan Contact Information

Task	**Contact Person**	**Contact Information**
FPP Administrator	Wilbert Anderson	Work 727-8757Cell Phone 552-1299
Fuel Source Control	N/A	
Ignition Source Maintenance	N/A	
Fire Control Equipment	Wilbert Anderson	Work727-8757 Cell 552-1299
Housekeeping	Physical Plant	727-8866
Employee Training	Wilbert Anderson	Work 727-8757Cell Phone 552-1299
Emergency Services	TU Police Dept	727-8757

FPP Administrator. The FPP administrator is responsible for all elements of the FPP and has the authority to make necessary decisions to ensure its implementation. The administrator will periodically audit the FPP as necessary to ensure its effectiveness.

N/A has access to the controls for all fuel sources at the facility and is responsible for disconnecting them during an emergency.

N/Ais responsible for maintaining ignition source equipment to ensure that such equipment is operating properly.

Anwar Diop is responsible for the inspection and maintenance of fire control equipment.

N/A is responsible for controlling the accumulation of flammable and combustible waste materials.
Mr. Wilbert Anderson is responsible for training employees to understand and implement the elements of the FPP.
Tuskegee University Police Department is responsible for providing emergency services.

Plan Review and Update
The FPP will be reviewed annually, and updated when:

- New hazards are identified or existing hazards change.
- There are changes to the fire protection systems.
- There are changes to fire prevention procedures.

Definitions

Exit—the portion of an exit route that is generally separated from other areas to provide a protected way of travel to the exit discharge. An example of an exit is a 2-hour fire resistance-rated enclosed stairway that leads from the fifth floor of an office building to the outside of the building.

Exit route—a continuous and unobstructed path of exit travel from any point within a workplace to a place of safety (including refuge areas). An exit route consists of three parts: the exit access; the exit; and the exit discharge. (An exit route includes all vertical and horizontal areas along the route.)

Major Fire Hazards, Potential Ignition Sources, Controls, and Fire Control Equipment
The table below contains a list of the major workplace fire hazards and potential ignition sources at the facility, their proper handling/storage and control procedures, and the fire protection equipment or systems used to prevent, control, or extinguish fires.

Fire Hazards, Sources, and Fire Control

Fuel Source Hazard	**Ignition Source Hazard**	**Handling/Storage/ Control Procedure**	**Fire Protection System/Equipment**
[Specific fire or fuel source hazard, e.g., oily rags, office trash, combustible wastes]	*[Specific ignition source, e.g., smoking, electrical equipment, hot work (welding, etc.), flame-producing equipment]*	*[Specific control procedure, e.g., hot work permit, ventilation, closed containers, chemical segregation]*	*[Specific system or equipment, e.g., sprinklers, fire extinguishers (types)]*
Physical Plant for office and Lab trash	N/A	Flammable and Acid Cabinets for chemical segregation	Fire extringuishers A,B,C , Ceiling sprinklers
Source	Source	Mr. Wilbert Anderson contact person	Mr. Wilbert Anderson
Source	Source		Contact person

Housekeeping
Flammable and combustible materials and residues will be controlled so that they do not cause or contribute to a fire emergency.

Gasoline. Gasoline will be stored in OSHA-approved safety cans of not more than 5-gallon capacity with a spring-closed lid and spout cover and designed to safely relieve internal pressure under fire exposure. The gasoline storage area will be posted on the outside with a sign labeled "Flammable—Keep Fire Away." The area must be 500 feet from another building and have a fire resistance rating of at least 2 hours.

Maintenance of Ignition Sources
Equipment and systems installed on heat- or ignition-producing equipment and processes will be maintained to prevent the accidental ignition of flammable and combustible materials.

Extension cords. Electric extension cords will be inspected before each use and kept in good condition. Employees will not yank cords from electrical outlets. Tools and equipment that require grounding will be of the three-wire grounded-connection type. Never use extension cords to replace permanent wiring. If an extension cord is used for temporary wiring, it must be listed by Underwriters Laboratories or another recognized testing laboratory. Avoid kinking or excessive bending of the cord; broken strands may pierce the insulated covering and become a shock or short-circuit hazard.

Employee Training
Training for employees about the FPP will be provided:

- At the time of initial work assignment
- Whenever new fire hazards are introduced into a work area
- Whenever employees are transferred to a new work area
- Training topics will include:
- The fire hazards of the materials and processes to which employees are exposed
- Procedures for controlling the accumulations of flammable and combustible materials, including material handling and storage
- Applicable elements of the hazard communication program

Recordkeeping
A record of FPP training for employees will be maintained on site and in the Office of Environmental Safety.

Plan last updated: Date 7-20-20

PORTABLE FIRE EXTINGUISHERS PLAN

Policy Statement
The Office of Environmental Safety provides portable fire extinguishers for employees to use to extinguish incipient fires. The extinguishers are mounted and located so that they are easily identified and readily accessible to employees without subjecting the employees to potential injury.

Authority and Scope

Authority: 29 CFR 1910.157 (Portable Fire Extinguishers)

Scope: This Plan covers the placement, use, maintenance, and testing of portable fire extinguishers to extinguish incipient fires at the workplace.

Plan Administration
The table below provides the personnel and contact information for the administration of the fire extinguisher plan.

Program Contact Information*[Modify the list and following job functions as applicable to your lab.]*

Function	Name/Department	Contact Information
Safety and Health Program Administrator	Wilbert Anderson	Work 727-8757/Cell Phone552-1299 Number
Plant Manager	Harold Tate	727-8608
Safety and Security	Chief Patrick Mardis Sr.	work-727-8757
Environmental Safety Officer	Wilbert Anderson	work727/8757/ cell 552-1299
CVMNAH Chief Engineer		

Safety and Health Program Administrator. The Administrator will:

- Develop and revise, when necessary, the Fire Extinguisher Plan
- Provide relevant training to personnel who are authorized to use fire extinguishers.
- Develop and implement a fire extinguisher maintenance and update schedule
- Take corrective action when needed

Plant Manager. The Plant Manager will:

- Ensure that only authorized employees use fire extinguishers

Plan Review and Update

The Plan will be reviewed annually. It will be revised when:

- New fire hazards are introduced to the workplace
- The regulations change
- Operations at the facility change that affect accessibility and use of fire extinguishers
- Near misses or accidents demonstrate a failure of the Plan

Definitions

Incipient fire--a fire in its beginning stage that can be controlled or extinguished with a portable fire extinguisher without the need for protective clothing or breathing apparatus.

Portable fire extinguisher--a manually operated, pressurized container that contains an agent that when discharged can extinguish an incipient fire.

Portable Fire Extinguisher Use

Portable fire extinguishers are provided for use by designated employees as authorized and trained to use them to fight incipient fires. All other employees must evacuate immediately upon the sounding of a fire alarm or when instructed by authorized personnel.

Selection, Types and Locations of Portable Fire Extinguishers

Selection

Portable fire extinguishers have been selected and distributed at the facility by the Environmental Safety Officer or Chief Engineer for CVMNAH on the basis of the types of anticipated workplace fires and on the size and degree of hazard that would affect their use.

Types and Ratings

This facility maintains Type ABC U.L. (Underwriters Laboratories) – approved extinguishers for the following types of potential fires:

- Type A—ordinary combustibles such as wood, cloth, paper, rubber and many plastics
- Type B—flammable liquids, such as gasoline, oil, grease, tar, oil-based paint, lacquer, and flammable gas
- Type C—energized electrical equipment, including wiring, fuse boxes, circuit breakers, machinery and appliances

Locations

Portable fire extinguishers are located in or in close proximity (within 50 feet) to all fire hazard areas

Fire Extinguisher Operating Procedures

Employees will implement the pull-aim-squeeze-sweep (PASS) system for extinguishing incipient fires. Each employee will determine whether he or she is capable of fighting a fire on a case-by-case basis.

Following are the basic required conditions under which an employee may fight an incipient fire:

- The fire is small and at its beginning stage
- Heavy smoke is not present

- An appropriate fire extinguisher is readily available
- There is an unblocked exit immediately available for evacuation

One or more employees are authorized to get hold of the nearest appropriate extinguisher(s), move to a position upwind of the fire if the air is moving, and operate the extinguisher following the **PASS** procedure:

1. **P**--Pull the pin located in the extinguisher's handle.
2. **A**--Aim the nozzle at the base of the fire.
3. **S**--Squeeze the lever or handle.
4. **S**--Sweep from side to side at the base of the fire until the fire is out or the canister is empty.

Safety Precautions

Employees will evaluate the risks of fighting an incipient fire before attempting to extinguish it.

Escape if the fire grows. If employees elect to put out a fire and it grows too large to control, they will immediately escape through the nearest exit, and close--but NEVER LOCK--the door behind them if possible.

Keep away from hazardous substances. When hazardous substances are involved, smoke and gases released from a fire can be toxic, so employees should never attempt to put out a fire if they have any doubts about their own safety and health. If they have any doubts, employees will evacuate the area and wait for emergency responders who have the proper equipment and are trained in fire-fighting procedures.

Inspection, Maintenance, and Testing

All portable fire extinguishers will be maintained in a fully charged and operable condition and kept in their designated places at all times except during use.

Inspection and Maintenance

The Office of Environmental Safety will contract with the local fire department to visually inspect all portable fire extinguishers annually according to the following guidelines:

- Extinguishers must be located in their designated location, secured properly and the proper type for the hazard area.
- Access to extinguishers is not obstructed.
- Extinguishers are examined for obvious physical damage, corrosion, leakage, or clogged nozzles.
- Legible operating instructions are on the extinguisher nameplate facing outward.
- Seals and tamper indicators are not broken or missing.
- Pressure-gauge readings or indicators are in the operable ranges.
- Inspection tags must be initialed and dated

The environmental safety officer will conduct a maintenance check at least annually according to the following guidelines:

- Conduct all monthly inspection checks.
- Inspect the hose and nozzle for cracks, blockages, or other damage.
- Inspect the extinguisher shell for corrosion, dents, or other damage.

- Weigh carbon dioxide extinguishers to ensure no weight deviation greater than 10 percent.

Corrective Actions
Defective extinguishers will be removed immediately, and replaced with a functional fire extinguisher.

Recordkeeping
The Office of Environmental Safety will retain a record of the annual inspection and maintenance date for each extinguisher for at least one year after the last entry or the life of the extinguisher shell, whichever is less.

Maintenance Record form and maintenance records.
Records of inspections and maintenance procedures performed under contract by outside vendors must be submitted to the Office of Environmental Safety at the end of each contract year.

Hydrostatic Testing
All portable fire extinguishers will be hydrostatically tested at regular intervals and whenever they show evidence of corrosion or mechanical damage.

The Office of Environmental Safety will ensure that portable extinguishers are hydrostatically tested.

- The unit has been repaired by soldering, welding, brazing, or use of patching compounds
- The cylinder or shell threads are damaged
- There is corrosion that has caused pitting, including corrosion under removable name plate assemblies
- The extinguisher has been burned in a fire
- A calcium chloride extinguishing agent has been used in a stainless steel shell

Extinguishers subject to the exceptions described above will be tested or replaced immediately upon discovery of damage. An internal examination of cylinders and shells will be made prior to the hydrostatic tests.

Recordkeeping
The Office of Environmental Safety will retain a certified record of hydrostatic testing for each portable extinguisher. Each record will include the date of the test, the signature of the person who performed the test, and the serial number, or other identifier, of the fire extinguisher that was tested. Such records will be kept until the extinguisher is hydrostatically retested at the specified time interval, or until the extinguisher is taken out of service, whichever comes first.

Training
The Office of Environmental Safety will provide employees authorized to use portable fire extinguishers with an educational program upon initial employment and annually thereafter to familiarize them with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting. Employees who have been designated to use fire fighting

equipment as part of an emergency action plan will be trained in the use of the appropriate equipment.

Plan last updated: Date 7-20-20

ELECTRICAL SAFETY PLAN

Policy Statement

It is the policy of Tuskegee University to protect all employees from electrical hazards, including shock, electrocution, arc flash, arc blast, and fires. All electrical work will be conducted in a manner consistent with existing regulations and with recognized safe work practices. This Plan establishes safe work practices for routine operations. Operations that involve high voltage and other unique hazards will need additional procedures for the specific situation.

Authority and Scope

Authority: This Plan complies with electrical safety regulations at 29 CFR 1910.331 to 1910.335 *[replace with the state regulations if applicable.]*

Scope: The Electrical Safety Plan covers electrical safe work practices for qualified persons (i.e., persons trained to avoid the electrical hazards of working on or near exposed energized parts) and unqualified persons (i.e., persons with little or no training) who work on or near machines, equipment, or circuits that have not been placed in an electrically safe work condition (i.e., not locked/tagged out). It applies to:

- Premise wiring (i.e., installations of electric conductors and equipment within or on buildings or other structures and on other premises such as yards, parking and other lots, and industrial substations)
- Wiring for connection to supply
- Installations of other outside conductors on the premises
- Installations of optical fiber cable where such installations are made along with electric conductors

This Plan does not apply to electrical generation, transmission, and distribution systems.

Program Administration

The table below provides the employees and contact information for the administration of the electrical safety program.

Program Contact Information
[Modify the table and job descriptions that follow the table as applicable to your organization.]

Function	Name, job title, or department	Contact Information
Plan Administrator	Marcus Dean	727-8866/Cell Phone 421-0632
Supervisor(s)	Harold Tate	727-8608/Cell Phone
Maintenance Manager	Marcus Dean	727-8866 CellPhone 4210632

Plan Administrator. The Electrical Plan Administrator will provide safe work procedures and permits for electrical work as required, and provide and implement other critical procedures such as lockout/tagout, testing, and safety-related work practices as required by regulation. Specifically, the Administrator will:

- Ensure that employees who work or who may potentially work near exposed energized parts are trained and qualified.
- Ensure that approved, maintained, and tested personal protective equipment (PPE) and other electrical safety equipment are provided, available, and used properly.
- Establish, implement, and maintain procedures that will ensure electrical safe work practices.
- Establish and maintain records as required.
- The Administrator will also ensure that workers of all disciplines and their immediate supervisors working with, or in proximity to, electrical equipment receive:
- Electrical safety awareness training
- General and job-specific training in safe electrical work practices
- Training in NFPA and ANSI codes and standards

Supervisor(s). Supervisors will:

- Complete applicable training.
- Ensure that employees follow all electrical safety practices and procedures.
- Ensure that employees receive required training at the prescribed times.

Maintenance Manager. The Maintenance Manager will develop and institute an electrical safety maintenance program, provide qualified persons, and review and approve live work permits to work on or near energized parts.

Employees. All employees, including employees of contractors working at the College of Veterinary Nursing, and Allied Health work sites, are responsible to comply with all safety rules and policies as directed by the Office of Environmental Safety that apply to their own actions and conduct, including immediate reporting to management of unsafe and unhealthful conditions.

On-Site Contractors and Subcontract

All references in the Plan to "employees" or "workers" apply to the employees of on-site contractors and subcontractors.

All on-site contractors and subcontractors will ensure that they and their employees:

- Have received electrical safety training corresponding to each employee’s work requirements, and that such training is documented
- Report all electrical hazards to Tuskegee University Construction Management
- Report all electrical injuries, including but not limited to shocks, burns and arc flashes to Tuskegee University Construction Management.
- Read, understand, and follow applicable electrical safety-related operating procedures prescribed by electrical safety regulations and by [Company Name Here].
- Adopt and implement safe electrical work practices.

- Use appropriate PPE and electrical safety equipment. Communicate electrical safe work practices with Tuskegee University Construction Manager.

Program Review and Update

Plan will be reviewed and updated periodically and whenever:

- New types of electrical utilization systems or equipment are introduced into the workplace
- Evaluations of workplace hazards, injuries, and near-misses demonstrate that the current plan is outdated or not effective.
- When regulatory or national consensus standards change that require this Plan to be updated.

Definitions

Circuit breaker (600 volts nominal, or less)--a device designed to open and close a circuit by no automatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

Circuit breaker (over 600 volts, nominal)--a switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

Certified equipment--equipment that (a) has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or (b) is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and (c) it bears a label, tag, or other record of certification.

Electrically safe work condition --a state in which the conductor or circuit part to be worked on or near has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage, and grounded if determined necessary.

Equipment--material, fittings, devices, appliances, fixtures, and apparatus used as part of, or in connection with, an electrical installation.

Ground--a conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Ground-fault circuit-interrupter (GFCI)--A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit

Qualified person--an employee familiar with the construction and operation of the equipment and the hazards involved.

Buddy--a person whose specific duties are to observe workers and operations that involve electrical work.

Unqualified person--an employee with no familiarization with or training in the construction and operation of the electrical equipment and hazards involved.

Utilization equipment--utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose, and includes laboratory and shop equipment, appliances, or other devices that operate from an electrical energy source.

Accident Investigations
All electrical incidents that result in injury to workers, as well as near misses, regardless of their nature, will be reported and investigated. Investigations will be conducted by the environmental safety officer or other competent person as soon after an incident as possible to identify the cause and means of prevention to eliminate the risk of reoccurrence. In the event of an incident that results in serious injury, this Plan will be reevaluated by the Tuskegee University Biosafety Committee to determine if additional controls, practices, procedures, or training is necessary to prevent similar future incidents.

Safe Work Practices
Basic Safety Practices
Exposed energized parts will first be deenergized, locked/tagged out, and tested by a qualified person to verify that an electrically safe work condition exists. If it is not feasible to deenergize, a written live work permit will first need to be prepared that establishes the safe work practices that must be followed.
Only a qualified person will deenergize, lock/tag out, and test electrical parts and equipment.
Only a qualified person will work on or near exposed live parts following the requirements of the live work permit.
General Safe Work Practices
All employees working on or near electrical equipment will follow general safe work practices, including:

- Maintain good housekeeping procedures.
- Plan and analyze for safety in each step of a project.
- Document work.
- Use properly rated test equipment and verify its condition and operation before and after use.
- Practice applicable emergency procedures.
- Become qualified in cardiopulmonary resuscitation (CPR) and first aid and maintain current certifications.
- Always wear appropriate PPE when working on or near electrical equipment.
- Refer to system drawings and perform system walk downs.
- Maintain electrical equipment in accordance with the manufacturer's instructions.
- Plan work projects through an approved work control process.

Housekeeping Duties
Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided. Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

Conductive Materials and Equipment
Conductive materials and equipment that are in contact with any part of an employee's body will be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee is expected to handle long dimensional conductive objects (such as

ducts and pipes) in areas with exposed live parts, the following work practices will be implemented to minimize the hazard:

- Insulate the conductive objects
- Provide guarding against contact
- Implement material handling techniques

Safety signs and tags. Safety signs, safety symbols, or accident prevention tags will be used where necessary to warn employees about electrical hazards which may endanger them. Such signs and tags will be designed and used in accordance with regulations (29 CFR 1910.145).

Barricades. Barricades will be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas exposing employees to uninsulated energized conductors or circuit parts. Conductive barricades may not be used where they might cause an electrical contact hazard.

Attendants. If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant will warn and protect employees.

Portable Equipment and Extension Cords

Portable equipment will be handled in a manner that will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment. Flexible cords may not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

Inspection. Portable cord and plug-connected equipment and flexible cord sets (extension cords) will be visually inspected before use on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jacket or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord and plug connected equipment and flexible cord sets (extension cords) which remain connected once they are put in place and are not exposed to damage need not be visually inspected until they are relocated.

If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item will be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

When an attachment plug is to be connected to a receptacle, the relationship of the plug and receptacle contacts will first be checked to ensure that they are of proper mating configurations.

Grounding-type equipment. A flexible cord used with grounding-type equipment will contain an equipment grounding conductor. Attachment plugs and receptacles may not be connected or altered in a manner that would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. Additionally, these devices may not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors. Adapters which interrupt the continuity of the equipment grounding connection may not be used.

Conductive work locations. Portable electric equipment and flexible cords used in highly conductive work locations (such as those inundated with water or other conductive liquids), or in

job locations where employees are likely to contact water or conductive liquids, will be approved for those locations.

Connecting attachment plugs. Employees' hands may not be wet when plugging and unplugging flexible cords and cord and plug connected equipment, if energized equipment is involved. Energized plug and receptacle connections may be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water). Locking type connectors will be properly secured after connection.

Test Instruments and Equipment
Only qualified persons may perform testing work on electric circuits or equipment.

Visual inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors will be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item will be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

Rating of equipment. Test instruments and equipment and their accessories will be rated for the circuits and equipment to which they will be connected and will be designed for the environment in which they will be used.

Electric Power and Lighting Circuits

Routine opening and closing of circuits. Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means will be used for the opening, reversing, or closing of circuits under load conditions. Cable connectors not of the load break type, fuses, terminal lugs, and cable splice connections may not be used for such purposes, except in an emergency.

Reclosing circuits after protective device operation. After a circuit is deenergized by a circuit protective device, the circuit may not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited. Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault condition, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

Overcurrent protection modification. Overcurrent protection of circuits and conductors may not be modified, even on a temporary basis, beyond that allowed by the installation safety requirements for overcurrent protection.

Interlocks
Only a qualified person may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system will be returned to its operable condition when this work is completed.

Overhead Lines
If work will be performed near energized overhead lines, either adequate clearance distance must be maintained, the lines must be DE energized and grounded, or other safety measures must be taken to protect all employees from electrical hazards. Protective measures may include:

- Keep vehicles, mechanical equipment, and unqualified persons at least 10 feet from overhead lines, adding 4 inches for every additional 10,000 volts. Qualified personnel must maintain approach distances as per OSHA Table S-5 (located in 29 CFR1910.333(c)(3)).
- Guard or place barriers between the lines and work areas.
- Have the lines insulated with brush guards by the company that supplies the power, and follow the company's requirements for working near the insulated lines.

Electrical Maintenance and Repair Operations
Only qualified persons will perform repair or maintenance work on electrical conductors or circuits. If an electrical hazard is discovered while repairs or maintenance work is performed, any further work must be suspended until the hazard is addressed and corrective actions instituted. Qualified persons performing such tasks as electrical repairs, modifications, and tests on energized conductors and circuit, parts, and equipment will comply with the following work practices.

Energized Parts and Equipment

- All circuits and equipment are considered energized until opened, locked/tagged out, and tested by a qualified person who verifies with an approved testing device that it is DE energized.
- Energized parts to which an employee might be exposed will first be deenergized and locked/tagged out unless [Company Name Here] can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. If live work is demonstrated, the live work permit needs to be completed.
- Operation of circuit breakers by employees is prohibited except in case of personal emergency.

Lockout/Tag out
Before repair or maintenance work is performed on electrical equipment, the electrical energy isolating device will be turned off, and locked/tagged. See the **Lockout/Tag out Plan** for information about lockout/tag out procedures used at the facility.

Reporting Injuries
Any electrical injury, such as shocks and burns, will be reported immediately to a supervisor and to the Office of Environmental Safety and Physical Plant.

Preventive Maintenance
The Maintenance Manager will establish an electrical preventive maintenance program to ensure safe and reliable operation of electrical wiring, protection devices, and operating equipment such as switches, circuit breakers, utilization equipment, flexible cords, and appliances. The manager

will ensure that adequate resources are available to provide for compliance with applicable codes and standards. In addition, the manager will ensure that:

- Procedures are established for EPM intervals, inspections, tests, and servicing requirements.
- Records are maintained of all tests, inspections, servicing, and inventories.
- Documentation, tests, test intervals, and procedures are guided by the recommendations of NFPA 70B, manufacturer's recommendations, industry standards, or [Company Name Here] -adopted standards or regulations.
- Copies of all manufacturer's installation, operating, and maintenance instructions are maintained in a department file.
- Electrical preventive maintenance work is performed only by qualified persons.

Personal Protective Equipment

All managers and supervisors will ensure that adequate resources are available to provide employees with PPE in compliance with applicable codes and standards. Furthermore, they will ensure that employees use the appropriate PPE for their assigned task.

Emergency Procedures

In the event of a medical emergency, the person(s) requesting assistance will contact the Office of Environmental Safety, Department of Safety and Security, and Physical Plant by telephone. The emergency contact list is located at the end of this plan. If there is a person nearby trained in first aid, he or she will be contacted immediately to give assistance.

Electrical Code Compliance

Physical Plant will ensure that Tuskegee University complies with all applicable electrical requirement orders, the NFPA, ANSI C2, and the respective parts of 29 CFR 1910 and 29 CFR 1926.

Injury Recordkeeping

The Office of Environmental Safety will maintain comprehensive accident/ injury records and will maintain records of all accident investigation reports and data for five years.

Plan last updated: Date: 7-20-20

FIRST AID PLAN (GENERAL INDUSTRY)

Authority and Scope

Regulation: 29 CFR 1910.151

Scope: All employees, including all employees who are trained in first aid, are covered by this Plan.

Policy Statement

It is the policy of Tuskegee University to provide prompt emergency medical services and first-aid support to all personnel at the workplace who are injured or become ill.

Plan Administration (modify as needed)

Plan Administrator:	Wilbert Anderson	5521-229
Medical consultant:	Dr. Darnita Hill	334-727-8461/8642

The principal investigator/instructor/director is responsible for implementation of the first-aid plan, and will maintain, review, and update it whenever necessary to include new or modified tasks and procedures. The director of student health (medical consultant) will advise concerning matters of health in the workplace.

Plan Review and Update

The First Aid Plan will be reviewed periodically to determine if it continues to address the needs of the workplace. Training, supplies, equipment and first-aid policies will be modified to account for changes in workplace safety and health hazards, worksite locations and worker schedules since the last program review.

Definitions

Automated external defibrillator (AED) --a small, portable device attached to a person's chest with wires that checks the person's heart rhythm, and gives the heart an electric shock (called a defibrillating shock) if that rhythm is "off," that restores the correct, natural rhythm.

Blood borne pathogen--microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) which causes acquired immune deficiency syndrome (AIDS).

Cardiopulmonary resuscitation (CPR)--a method of mouth-to-mouth breathing and external cardiac compression to keep oxygenated blood circulating after the heart has stopped.

First aid--one-time treatment using a non-prescription medication at nonprescription strength; ointments; salves; bandages (including elastic and butterfly); finger guards; hot and cold therapies; eye patches; antiseptics; wraps; dressings; temporary immobilization devices (splints, slings, neck collars, back boards) for transporting accident victims; removing foreign

bodies from the eye using only irrigation or a cotton swab; cleaning, flushing, or soaking skin surface wounds; drilling of a fingernail or toenail to relieve pressure; and a tetanus immunization (but not other immunizations or vaccines). First aid is also emergency care, such as CPR, provided for an injury or sudden illness before emergency medical treatment is available.

Medical treatment--the response by professional medical personnel to serious injuries and illnesses such as puncture wounds, fractures, infections, second- and third-degree burns, and other injuries that require more than one-time first-aid treatment or observation.

Other potentially infectious material (OPIM)--body fluids visibly contaminated with blood, including saliva in dental procedures, semen, vaginal secretions, amniotic fluid, and other such material where it is difficult to differentiate between body fluids.

Personal protective equipment (PPE)--protective covering for the head, eyes, hands, feet, and body, such as gloves, face shield, face mask, eye protection, or an apron or gown.

First-Aid Plan Implementation

The principal investigator/instructor/director ensures the ready availability of medical personnel for advice and consultation on matters of occupational health.

Emergency Medical Services and First Aid

Prompt medical attention in case of injury or illness to employees will be provided by the Department of Safety and Security. Any employee who has a valid certificate in first-aid training from the the American Red Cross, or equivalent training that can be verified by documentary evidence is authorized to provide first aid before emergency medical services arrive.
The Department of safety and Security will coordinate prompt transportation of the injured person to a physician or hospital. For emergencies, contact 4911.

Blood borne Pathogens Training

Employees designated as responsible for rendering first aid or medical assistance will be instructed in the sources, hazards, and avoidance of blood borne pathogens, including universal precautions and the use of PPE.

First-Aid Supplies

First-aid supplies are readily available. Each first-aid kit is inspected and restocked by the principal investigator/instructor/director at least weekly to ensure that expended items are replaced. First-aid kits will meet the specifications of the American National Standard Institute's *Minimum Requirements for Workplace First Aid Kits*.

Protection Against Blood borne Pathogens

All employees administering first-aid will follow universal precautions to prevent contact with blood or OPIM and wear appropriate PPE. See below for the description of universal precautions and PPE requirements.

Protection Against Blood borne Pathogens

Universal Precautions

All employees will use universal precautions in order to prevent contact with blood or OPIM during the administration of first-aid, the removal of materials and waste from the first aid station, cleanup of any blood or OPIM, and housekeeping of any areas recently (i.e., same day) contaminated with blood or OPIM. All blood and OPIM will be considered infectious regardless of the perceived status of the source.

Engineering Controls and Work Practices

Engineering controls and work practices will be implemented to prevent or minimize exposure to blood borne pathogens. The principal investigator/instructor/director is responsible for ensuring that the engineering controls and work practices are implemented and updated as necessary.

Engineering Controls/Work Practices/Housekeeping:

- Wash hands immediately after contact with blood or OPIM.
- If handwashing facilities are not immediately available after exposure, exposed employee(s) will be provided with an antiseptic cleanser with cloth or paper towels or antiseptic towelettes. Exposed employees will wash their hands with running water and soap as soon as possible after using the antiseptic alternatives.
- When skin or mucous membranes are exposed to blood or OPIM, those areas of the body will be washed or flushed with running water as soon as possible after contact.
- After removal of PPE used during exposure to blood or OPIM, the employee(s) will wash hands or other exposed skin areas with running water and soap as soon as possible.
- Wash hands immediately or as soon as feasible after removing gloves or other PPE.
- Remove PPE after it becomes contaminated and before leaving the work area.
- Place used PPE in [list appropriate containers for storage, laundering, decontamination, or disposal].
- Wear appropriate gloves when it is reasonably anticipated that there may be hand contact with blood or OPIM, and when handling or touching contaminated items or surfaces; replace gloves if torn, punctured or contaminated, or if their ability to function as a barrier is compromised.
- Utility gloves may be decontaminated for reuse if their integrity is not compromised; discard utility gloves if they show signs of cracking, peeling, tearing, puncturing, or deterioration.
- Wear appropriate face and eye protection when splashes, sprays, spatters, or droplets of blood or OPIM pose a hazard to the eye, nose, or mouth.
- Remove immediately or as soon as possible any garment contaminated by blood or OPIM, in such a way as to avoid contact with the outer surface.

The principal investigator/instructor/director evaluates new exposure control procedures and new products regularly.

PPE

All PPE is provided to employees at no cost to them. PPE will be chosen based on the anticipated exposure to blood or OPIM. The PPE will be considered appropriate only if it does not permit blood or OPIM to pass through or reach the employee's clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which it will be used.

The table below describes in detail how PPE will be provided and the types of PPE that will be given to employees.
Provision of PPE to Employees

How Provided	PPE Distributor	Procedures Requiring PPE	Type of PPE Required
NA	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Labotoratory Not working with Blood Borne Samples

Blood-contaminated PPE

If PPE or personal clothing is splashed or soaked with blood or OPIM, the person wearing the PPE or clothing will remove the contaminated clothing as soon as possible. This clothing will be laundered at the employer's expense. The clothing would be identified as contaminated and any employee exposed to it would be notified and protected from exposure.

Gloves

Gloves will be worn where it is reasonably anticipated that employees will have hand contact with blood, other potentially infectious materials, non-intact skin, and mucous membranes. Disposable gloves will not be washed or decontaminated for re-use and will be replaced when they are torn, punctured, or when their ability to function as a barrier is compromised.

PPE Training

All employees covered under the requirements of this Plan will be trained to properly use, put on, take off, decontaminate, maintain, and store PPE. Training in the use of the appropriate PPE is provided by the principal investigator/instructor/director.

Emergency Showers and Eyewash Facilities

Emergency showers and eyewash facilities are available for employees exposed to hazardous chemical splashes or other contact. The facilities are located Location, Building Hallways

AED(if available)

An AED is used to treat a person who experiences sudden cardiac arrest.. A person may not use an AED on another person unless the person using the AED has successfully completed a course, approved by the American Red Cross, the American Heart Association in the use and operation of the AED, and has made a reasonable attempt to summon appropriate emergency services personnel when communication is possible.

Accident Reporting and Recordkeeping

All injuries and illnesses that require treatment by professional medical personnel will be recorded in the injury and illness log. Minor injuries that require only first aid will not be recorded in the log. Daily records of all first-aid treatments not otherwise reportable as an injury or illness will be maintained on prescribed forms and furnished to the environmental safety officer upon request.

Copies of employee first-aid certificates are maintained at the office of the Plan Administrator.

Date of incident: _____ Time of incident: _____
Person(s) injured/ill: _____
_____ _____
Location of incident (facility, address, building, floor): _____
_____
Company responsible for site activities: _____
Company responsible for injured/ill employee(s): _____

Incident description (number of persons injured, sequence of events that led to injury/illness, extent of injury and/or property damage):
_____
_____
_____
_____

Cause of incident (objects or substances involved, and/or activities or unsafe acts in progress):
_____
_____
_____
_____

Initial corrective action: _____
_____
_____

Planned corrective action: _____
_____
_____

Plan last updated: Date: 7/20/20

ACCIDENT INVESTIGATION PLAN

Policy Statement

It is the policy of Tuskegee University to identify any hazardous conditions or unsafe actions that occur after all appropriate safety controls are in place, to determine the causes of the hazards or unsafe actions, and to take immediate corrective action.

Authority and Scope

Authority. Process safety management investigation requirements under 29 CFR 1910.119(m).

Scope. All accidents that cause or have the potential to cause serious injuries to employees, contractor employees, visitors, and damage to the property of Tuskegee University are covered by this Plan.

The accident reports generated under this Plan is used to fulfill in part the OSHA injury and illness reporting requirements under 29 CFR 1904.

Program Administration

The table below provides the personnel and contact information for the administration of accident investigations.

Program Contact Information

[Modify the list and following job functions as applicable to your organization.]

Function	Name/Department	Contact Information	
Safety and Health Program Administrator	Name Wilbert Anderson Safety Officer & Security Police Department	Work phone: Number 727-8757	Cell phone: Number 552-1299
Principal Accident Investigator	Name Wilbert Anderson Safety Officer & Security Police Department	Work phone: Number 727-8757	Cell phone: Number 552-1299
Accident Investigator	Name Wilbert Anderson Safety Officer & Security Police Department	Work phone: Number 727-8757	Cell phone: Number 5521299
Environmental safety Officer	Name Wilbert Anderson Safety Officer & Security Police Department		
Supervisor(s)	Name Wilbert Anderson Safety Officer & Security Police Department	Work phone: Number	Cell phone: Number
Human Resources Manager	Daphne Charley	727-8940	

Safety Committee Chairperson	Dr. Vijaya Rangari	334- 724-4875	334-524-2387

Safety and Health Program Administrator. The Administrator will:

- Develop and revise, when necessary, the Accident Investigation Plan.
- Provide relevant training to ensure that accident investigators and other personnel involved in accident investigations properly carry out investigations.
- Monitor corrective actions implemented as a result of accident investigations.
- Make recommendations when needed concerning the effectiveness of corrective actions.

Principal Accident Investigator. The Principal Accident Investigator will direct and/or conduct investigations of all accidents and injuries sustained by employees, contractor employees while they are working at a [Company Name Here] work site, and visitors to [Company Name Here] work sites, according to the procedures outlined in this Plan. He or she will develop and implement corrective actions to prevent the causes of accidents and injuries identified through accident investigations.

Accident Investigator(s). The Accident Investigator will conduct investigations and implement corrective actions as directed by the Principal Accident Investigator.

Supervisor(s). Supervisors must:

- Ensure that injured or ill employees receive immediate medical attention.
- Immediately notify [name, job title, or department] of the accident, injury, or near-miss, including any damage to equipment or other property.
- Advise the employee of his or her accident reporting requirements and provide the employee with [name/number of the worker's compensation claims form], then send the completed form to [name, job title, or department] within 24 hours.

Human Resources Manager. The Human Resources Manager will provide the authorization for medical treatment of employees prior to their employment. Such staff will contact the employee(s), describe benefits, and develop a plan for returning the employee(s) to work.

Employees. All employees of [Company Name Here], including employees of contractors working at [Company Name Here] work sites, must report work-related injuries and illnesses to their supervisor(s) and complete the employee section of the [name of the accident report form].

Program Review and Update

This Plan will be reviewed and updated as needed to maintain the integrity of the accident investigation and reporting program.

Definitions

Accident--any unplanned and undesired event that results in personal injury or in property damage.

Near-miss incident--an unplanned, undesired event that adversely affects completion of a task and does not result in an injury that requires medical treatment nor causes property damage.

Direct cause--a person or property receives an amount of energy or hazardous material that cannot be absorbed safely.

Indirect cause--unsafe acts and conditions. Basic cause—poor management policies and decisions, or personal or environmental factors, which lead to indirect causes.

Medical treatment--response by professional medical personnel to serious injuries and illnesses, such as puncture wounds, fractures, infections, second- and third-degree burns, and other injuries that require more than one-time treatment or observation.

Near miss--incidents where no property was damaged and no personal injury sustained, but where, given a slight shift in time or position, damage and/or injury easily could have occurred.

Accident Investigation and Reporting Procedures

Injury to Employees/Property Damage

If an employee sustains a work-related injury, the employee or a co-worker will immediately notify the supervisor of the work-related injury or illness, and the supervisor will ensure the injured or ill employee receives prompt medical treatment. The employee will complete the employee part of the Accident Report Form. If the date and time of the injury or illness cannot be determined, such as an injury caused by cumulative or repeated stress, the date of the last time that the employee worked is entered on the form.

Any person who observes or causes damage to property or equipment will immediately report such damage to a supervisor.

Injury to Visitors

Injuries sustained by visitors at a Tuskegee University work site will be reported to the Department of Safety and Security. Injured visitors will be provided immediate medical treatment if necessary. The causes of injuries to visitors will be investigated through the same processes as for an employee accident investigation.

Near-Miss Incident

The investigation procedures for near-miss incidents will follow an abbreviated outline derived from the Accident Investigation Report procedures.

See Near-Miss Investigation Report form.

Accident Investigation Procedures

The Principal Accident Investigator and/or other Accident Investigator(s) will follow the procedures outlined below to conduct accident investigations:

1. Launch an accident investigation after a work-related injury or illness that requires medical treatment or property damage occurs at any [Company name] work site.
2. Assign investigators to carry out specific tasks. Such tasks include:
    - Inspect the accident site.
    - Interview witnesses and injured person(s).
    - Compile and review data.
    - Develop recommendations for corrective action(s).
    - Compile the written investigation report.

3. Present a preliminary briefing to the investigating team, including:
    - A description of the accident, with damage estimates
    - Normal operating procedures
    - Maps (local and general)
    - The location of the accident site
    - List of witnesses
    - Events that preceded the accident
4. Visit the accident site to:
    - Secure the site to protect evidence and prevent further injuries.
    - Inspect the area, including walking and working surfaces, equipment, entrances and exits, air quality systems, and all other conditions, processes, or items that could possibly have contributed to the accident or injury.
    - Record by tape recorder (if feasible) and in writing the details of the accident site, including lighting conditions, other environmental factors, and any unsafe conditions, tools, equipment, or operations.
    - Document the location of victims, witnesses, machinery, energy sources, and hazardous materials.
    - Prepare the necessary sketches and photographs, label each item carefully, and keep accurate records.
5. Interview each injured person and witness. Also, interview those who were present before the accident and those who arrived at the site shortly after the accident. Keep accurate records of each interview. Use a tape recorder if desired and if approved. See the Accident Witness Statement Form and instructions for conducting interviews.
6. After all information from the accident site and interviews have been collected, record the following:
    - Define the problem (what happened?).
    - Establish the norm (what should have happened?).
    - Identify, locate, and describe the change (what, where, when, to what extent).
    - Specify what was and what was not affected.
    - Identify the distinctive features of the change.
    - List the possible causes.
    - Select the most likely causes.
7. Analyze the data collected from the determination/analysis of accident causes. Repeat any of the prior steps, if necessary. Determine:
    - Why the accident occurred
    - A likely sequence of events and probable causes (direct, indirect, and basic)
    - Alternative sequences
8. Check each sequence against the data from the determination/analysis of accident causes.
9. Determine the most likely sequence of events and the most probable causes.
10. Develop recommendations for corrective action, if needed.
11. Conduct a post-investigation briefing.
12. Prepare a summary report including the recommended actions to prevent a recurrence, and distribute the report according to applicable instructions. See the Accident Investigation Report form and instructions.

Accident Investigation Reports

All investigations of accidents and injuries will be reported on the prescribed Accident Investigation Report form. See the Accident Investigation Report form.
All near-miss incidents and injuries that do not require medical treatment will be reported promptly to the principal investigator/instructor/director. See the Near-Miss Incident Report form. Accident investigators will submit all completed accident investigation reports to the Office of Environmental Safety for review.

Corrective Actions
The Biosafety Committee must approve the recommendations for corrective action outlined in the Accident Investigation Report. Once approved, principal investigator/instructor/director will incorporate the corrective actions into the Tuskegee University safety and health program.

Training
The Administrator will ensure that investigators and others engaged in accident investigations are trained in the techniques of workplace accident investigation, and that they receive all manuals, guides, and other information related to accident investigation.
The training program will include the following topics:

- Initiating the accident investigation
- Inspection and documentation of the accident scene
- Interviews
- Accident analysis
- Root cause determination
- Development of recommendations for corrective action
- Writing the Accident Investigation Report

Recordkeeping
The Office of Environmental Safety will maintain comprehensive accident/ injury records and will maintain records of all accident investigation reports and data for five years.

Supporting Materials
Near-Miss Investigation Report
Accident Witness Statement Form
Accident Investigation Report

Accident Investigation Report

Attention: *This form contains information relating to employee health and other privacy concerns and must be used in a manner that protects the confidentiality of employees to the fullest extent possible while the information is being used for occupational safety and health purposes.*

Reason for report: ___ Injury ___ Illness ___ Accident ___ Fatality
Primary Investigator's name: _____ Investigation date: _____
Job title: _____ Phone: _____
Investigator(s):
_____

Employee Injury/Property Damage Information

Employee name: _____ Date of birth: _____
Occupation: _____ Phone: _____
Sex: Male Female (circle one)
Date and time of injury/damage: _____ Time: _____ AM / PM
Exact location of the accident:
_____
Witnesses:
_____
_____

Did the accident result in the death of one or more persons?	Yes No
Did the accident result in the hospitalization of three or more persons?	Yes No
Was medical treatment provided?	Yes No
Was this a recordable injury or illness?	Yes No

If so, describe the treatment:

Did the employee lose time from work?	Yes No
Was the employee placed on restricted or light duty, or transferred to another job?	Yes No

If so, describe:

Amount of property damage: Dollar Amount

Accident Account

Describe the accident (in the sequence that events occurred):

Describe the extent of injury or illness and body parts affected/property damage:

Specify the hazardous condition (source of unsafe energy or hazardous material):

Specify the unsafe act:

Discussion

Direct Causes—Energy Sources or Hazardous Materials. Discuss the specific energy sources (e.g., moving object or machine part) or hazardous materials, including how and why the sources or materials resulted in injury or property damage:

Indirect Causes—Unsafe Acts or Hazardous Conditions. Discuss the normal or expected safe work conditions and practices, and the deviations from such conditions and practices that resulted in the injury or property damage:

Basic Causes—Management Policies, Personal, or Environmental Factors

Was injury or damage caused by employee's willful misconduct, intoxication, or intent to injure self or another? Yes No

If yes, describe:

Was the incident a result of violation of established safety policies? Yes No

If yes, explain:

Has the employee received training to perform this procedure safely? Yes No

If no, explain:

Was adequate personal protective equipment provided for the required tasks? Yes No

If no, explain:

Are changes necessary in the operations or procedures to prevent this type of incident in the future? Yes No

If yes, explain:

Discuss any additional policies, personal factors, and environmental factors that led to hazardous conditions or unsafe acts:

Recommended Corrective Actions

Describe recommendations for corrective action(s):

Schedule for the completion of corrective action(s):

Primary Investigator's Signature: _____

Name (print): _____

Date: _____

Distribution: Employee, Employee's Supervisor, Biosafety Committee, Environmental Safety Officer, Human Resources

Accident Witness Statement Form

Name:	Job Title:
Telephone:	Supervisor:
Work Location:	
Location of Accident:	
Accident Time and Date:	
Please fully describe the accident sequence from start to finish (use additional paper as needed):	
Please fully describe the work and conditions in progress leading up to the accident (use additional paper as needed):	
Note anything unusual you observed before or during the accident (sights, sounds, odors, etc.) (use additional paper as needed):	

What was your role in the accident sequence? (use additional paper as needed)
What conditions influenced the accident (weather, time of day, equipment malfunctions, etc.)? (use additional paper as needed)
What do you think caused the accident? (use additional paper as needed)
How could the accident have been prevented? (use additional paper as needed)
Please list other possible witnesses (use additional paper as needed):

Additional comments/observations (use additional paper as needed):	
Signature:	Date/Time:

Accident Witness Interview Instructions

In general, experienced personnel should conduct interviews. If possible, the team assigned to this task should include an individual with a legal background. Follow these procedures for conducting interviews:

1. Appoint a speaker for the group.
2. Get preliminary statements as soon as possible from all witnesses.
3. Locate the position of each witness on a master chart (including the direction of view).
4. Arrange for a convenient time and place to talk to each witness.
5. Explain the purpose of the investigation (accident prevention) and put each witness at ease.
6. Listen, let each witness speak freely, and be courteous and considerate.
7. Take notes without distracting the witness. Use a tape recorder only with consent of the witness.
8. Use sketches and diagrams to help the witness.
9. Emphasize areas of direct observation. Label hearsay accordingly.
10. Be sincere and do not argue with the witness.
11. Record the exact words used by the witness to describe each observation. Do not "put words into a witness' mouth."
12. Word each question carefully and be sure the witness understands.
13. Identify the qualifications of each witness (name, address, occupation, years of experience, etc.).
14. Supply each witness with a copy of his or her statements. Signed statements are desirable.
15. After interviewing all witnesses, analyze each witness' statement. Re-interview one or more witnesses to confirm or clarify key points if needed. While there may be inconsistencies in witnesses' statements, assemble the available testimony into a logical order. Analyze this information along with data from the accident site.

Near-Miss Incident Report
Please complete and submit this form within 24 hours of the incident.
Date: _____
Date of incident: _____ Time of incident: _____ AM / PM
Exact location: _____
Submitted by: _____ Department: _____
Job activity at the time of the near-miss:
_____
_____
_____
Description of the near-miss incident (attach photos or diagrams if available):
_____
_____
_____
_____
_____
_____
Specify the hazardous condition:
_____
_____
_____
Specify the unsafe act:
_____
_____
_____
Other employees involved, if any:
_____
Preventive action recommended:
_____
_____
_____
Corrective actions taken:
_____
_____
_____
_____

Supervisor responsible: _____

Emergency Services Personnel Contact Information

Service	**Contact**	**Telephone**
Emergency Response Coordinator	TU security	727-8757
Ambulance/EMS		911
TU Police	Chief Mardis	727-8757
Fire	Security Police	727-8757
Primary Medical Facility	Student Health	7248641
Secondary Medical Facility	East Alabama medical Center	334-749-3411
Poison Control Center	National office	800-292-6678 800-464-0800
Other	Name	Number
Other	Name	Number

Plan last updated: Date:7/20/29

MATERIAL SAFETY DATA SHEET (MSDS) PLAN

Policy Statement

It is the policy of Tuskegee University to reduce employee exposure to hazardous chemicals and the overall incidence of chemical-related injuries and illnesses. All employees who are potentially exposed to hazardous chemicals in their assigned jobs must be fully informed of both the hazardous properties of the chemicals and the protective measures that are available to minimize exposure to these chemicals. This type of information will be made available to employees by means of labels on chemical containers, MSDSs, and training. Employees will be informed of any known hazards associated with chemicals to which they may be exposed before their initial assignment, whenever the hazards change, or when new hazardous chemicals are introduced into their respective work areas.

AUTHORITY AND SCOPE

Authority: 29 CFR 1910.1200(g) Hazard Communication Standard

Scope: This program covers all work operations at Tuskegee University where employees may be exposed to hazardous chemicals under normal working conditions or during an emergency situation.

PLAN ADMINISTRATION

The table below provides the roles and contact information for the administration of the hazard communication program.

Program Contact Information

Task	Contact Person	Contact Information
MSDS Plan Administrator	Name, Job Title, and Department	Work/Cell Phone Number
Employee Training	Name, Job Title, and Department	Work/Cell Phone Number

The Plan Administrator is responsible for maintaining up-to-date MSDSs and ensuring that they are readily accessible in all work areas.

Employee training. The principal investigator/instructor/director is responsible for training employees concerning hazardous chemicals in their work areas.

Plan Review and Update
This Plan will be periodically reviewed and updated whenever new hazards are introduced into the workplace.

Plan Availability
Copies of the Plan, including the written training program, are available upon request to employees, their designated representatives, the state or federal safety regulatory agency, and to the National Institute of Occupational Safety and Health. Copies of the Plan are available on site.

DEFINITIONS

Chemical—any element, chemical compound or mixture of elements and/or compounds

Hazardous chemical—any chemical which is a physical hazard or a health hazard

Material safety data sheet (MSDS)—a written description of a hazardous chemical or chemical product which contains comprehensive technical information about a particular substance and explains the risks, precautions, and remedies to exposure related to hazardous chemicals

MSDS PROCEDURES
The principal investigator/instructor/director is responsible for maintaining the MSDS program and ensuring that procedures are developed to obtain the necessary MSDSs, reviewing incoming MSDSs for new or significant health and safety information, and will see that any new information is communicated to affected employees.

MSDS Access
MSDSs will be readily available to all employees during each work shift. The primary method for accessing MSDSs in work areas is printed copies.

MSDS Not Available
If an MSDS is not available, or an employee has a problem accessing MSDSs, contact the principal investigator/instructor/director. The designated person will ensure that the missing MSDS is provided to the employee requesting it by his or her next work shift at the latest, unless the company has not received the MSDS from the chemical supplier.

If an MSDS is not received at the time of initial shipment, the principal investigator/instructor/director will contact the supplier, in writing, to request the MSDS. If an MSDS is not received from the supplier in 15 days, contact the appropriate the Office of Granstmanship and Compliance or Office of Environmental Safety.

New or Revised MSDSs
The notice that identifies the person responsible for maintaining MSDSs and where the MSDSs are located are posted on site. Employees will be notified at the same location(s) when new or

revised MSDSs are received. When new or revised MSDSs are received, the following procedure will be followed to replace old MSDSs:

1. Place the new MSDS in front of the old MSDS.
2. The old MSDS will be retained for one year following replacement.

EMPLOYEE TRAINING AND INFORMATION

The principal investigator/instructor/director is responsible for the MSDS Plan training and will ensure that all program elements are carried out.

Initial Training

Everyone who works with or is potentially exposed to hazardous chemicals will receive initial training on the Hazard Communication Standard and this MSDS Plan before starting work. Before a new hazardous chemical is introduced into any work area, each employee in the affected work area will be given information and training, including MSDS training, for the new chemical hazard.

Retraining

Additional training will be conducted by the principal investigator/instructor/director when new chemicals are introduced into the work area. Retraining is not required if the new chemical contains hazards similar to previously existing chemicals for which training has already been conducted.

Recordkeeping

All employees attending hazard communication training sessions must sign a sheet at the end of the session verifying their attendance. The sheet must contain the date of training and the instructor's name.

Training Content and Format

Each new employee will receive information and training that covers:

- The hazardous chemicals present at his/her work area
- The physical and health risks of the hazardous chemicals
- Symptoms of overexposure
- How to determine the presence or release of hazardous chemicals in the work area
- How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices and personal protective equipment
- Steps have taken to reduce or prevent exposure to hazardous chemicals
- Procedures to follow if employees are overexposed to hazardous chemicals
- How to read labels and MSDSs to obtain hazard information
- The location of the MSDS file system and written Hazard Communication Plan

MULTI-EMPLOYER MSDS ACCESS POLICY

Informing Contractors

It is the responsibility of the principal investigator/instructor/director to provide other employers and contractors with information about hazardous chemicals that their employees may be exposed to on a job site and precautionary protective measures for their employees. It is the

responsibility of the construction manager to obtain information about hazardous chemicals used by other employers or contractors to which employees of this organization may be exposed. Other employers and contractors will be provided with MSDSs for hazardous chemicals introduced into the work area by Tuskegee University in the following manner:

The principal investigator/instructor/director makes the MSDSs of all purchased chemicals available to all employees of any employer through the electronic MSDS database. Any employee can access an MSDS for a chemical by searching this database. If an employee does not have computer access, paper copies will be provided by the principal investigator/instructor/director upon request.
In addition to providing a copy of an MSDS to other employers, other employers will be informed of necessary precautionary measures to protect employees exposed to operations performed by this organization.

Contractor Responsibilities
Any contractor working on Tuskegee University perated property is responsible for developing, implementing and informing the other on-site employers about any chemicals or chemical hazards introduced to the work site. Each contractor must provide the construction manager, and any other contractors or employers working on-site, with unrestricted, on-site access to MSDSs for all hazardous materials used, handled or stored on-site to which an employee of Tuskegee University or another contractor may potentially be exposed to during their normal course of work. Each outside employer working on-site must also ensure that the hazards of chemicals or materials used, handled and/or stored on-site are identified and that information regarding precautionary measures necessary to limit the potential exposure of employees working in the area is exchanged with the construction manager and all other affected employers.

Any agreement or contract for service with Tuskegee University will include a written certification by the contractor concerning use of hazardous chemicals introduced to work sites by the contractor and associated hazards from the use of those hazardous chemicals. If such certification indicates that the use of hazardous chemicals will occur in an area that may potentially expose Tuskegee University employees, the construction manager will issue a SAFETY ALERT, in writing, to the potentially affected employees and volunteers.

The SAFETY ALERT will:

- Inform employees and volunteers of the presence of hazardous chemicals.
- The period of time the hazardous chemicals will be present.
- Where the contractor's MSDSs are located if additional information is desired by the employees or the volunteers.

Last Update Date: 7/20/20

CHEMICAL HAZARDOUS PLAN

Regulatory Standard: OSHA - 29 CFR 1910.106

Introduction

There are an estimated 575,000 existing chemical products, and hundreds of new ones being introduced annually. Many of these chemical products contain properties that are flammable or combustible. This poses a serious problem for exposed workers and their employer. The OSHA Flammable and combustible liquids Standard establishes uniform requirements to ensure that the hazards associated the storage, handling, and use of all chemicals used in U.S. workplaces are evaluated, and that this hazard information is transmitted to all affected workers.

Due to the dangers of some acids and bases, it is very important to follow certain guidelines when working with these hazards. There are several steps that can be taken to ensure that you are promoting a safe work environment for you and your employees. Following specific lab procedures, wearing the correct personal protective equipment (PPE) and using proper storage and disposal methods are all essential to accomplishing this goal.

Tuskegee University will ensure that the hazards of all chemicals used within our facilities are evaluated, and that information concerning their hazards is transmitted to all affected employees. This standard practice instruction is intended to address comprehensively the issues of; storage, handling, and use of chemicals, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

Tuskegee University Environmental and Safety Officer is Anwar Diop. He is solely responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The Environmental and Safety Officer is the sole person authorized to amend these instructions and is authorized to halt any operation of the company where there is danger of serious personal injury.

Principal investigators/Department heads control the work environment. This standard practice instruction will be adhered to by all supervisors. If proper workplace controls are not enforced,

the storage and dispensing of flammable and combustible liquids can be extremely dangerous. To prevent catastrophic results, supervisors are required to strictly enforce these procedures.

This written program summarizes the primary areas where an environmental and safety officer would like to address specific hazards and provide policy on the safe storage and dispensing of these liquids in a plant environment. It must be understood that detailed assessments of each area must be conducted first. Once the assessments are conducted then these procedures may be amended to reflect accurately the results of such assessments.

FLAMMABLE AND COMBUSTIBLE LIQUIDS

Emergency instructions.

- All storage and dispensing locations will have detailed written emergency instructions for each location. Each instruction will detail the emergency actions to be taken in the event of fire, spill, leak, power failure, failure of any safety system (including detection/monitoring and ventilation systems) and any other emergency condition affecting the safe operation of the area.

- Written emergency instructions will be posted at the entrance to all storage and dispensing location, or in a conspicuous manner in the area.

Classes of Flammable and Combustible Liquids. The following information is provided to ensure that users of this document are aware of the classes of flammable and combustible liquids.

- Flammable liquid is defined as any liquid having a flashpoint below 100 deg. F. (37.8 deg. C.), except any mixture having components with flashpoints of 100 deg. F. (37.8 deg. C.) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids are known as Class I liquids. Class I liquids are divided into three classes as follows:

  - Class IA includes liquids having flashpoints below 73 deg. F. (22.8 deg. C.) and having a boiling point below 100 deg. F. (37.8 deg. C.).

  - Class IB includes liquids having flashpoints below 73 deg. F. (22.8 deg. C.) and having a boiling point at or above 100 deg. F. (37.8 deg. C.).

  - Class IC includes liquids having flashpoints at or above 73 deg. F. (22.8 deg. C.) and below 100 deg. F. (37.8 deg. C.).

- Combustible liquid is defined as any liquid having a flashpoint at or above 100 deg. F. (37.8 deg. C.) Combustible liquids are divided into two classes as follows:

  - Class II includes liquids with flashpoints at or above 100 deg. F. (37.8 deg. C.) and below 140 deg. F. (60 deg. C.), except any mixture having components with flashpoints of 200 deg. F. (93.3 deg. C.) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.

  - Class III includes liquids with flashpoints at or above 140 deg. F. (60 deg. C.) Class III liquids are subdivided into two subclasses:

  - Class IIIA includes liquids with flashpoints at or above 140 deg. F. (60 deg. C.) and below 200 deg. F. (93.3 deg. C.), except any mixture having components with flashpoints of 200 deg. F. (93.3 deg. C.), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

- Class IIIB includes liquids with flashpoints at or above 200 deg. F. (93.3 deg. C.). This section does not cover Class IIIB liquids. Where the term "Class III liquids" is used in this section, it must mean only Class IIIA liquids.

Facility Assessment. All laboratories within Tuskegee University will be assessed for handling, storage, and use of flammable and combustible liquids. The facility assessment process will identify existing hazards and conditions, operations that create hazards, and areas where hazards may develop. This also includes close scrutiny and the tracking of accident records to identify areas that may indicate the development of future workplace hazards.

- The purpose of facility assessment, is to recognize, identify, and correct recognized and potential hazards.

- The objective will be to provide a starting point for finding and eliminating those work techniques, and workplace conditions which may be the source of problems. In addition to analyzing current workplace conditions, planned changes to existing and new facilities, processes, materials, and equipment can be considered to ensure that changes are made to enhance production and reduce or eliminate risk factors. The principles of Industrial Hygiene (Recognition, Evaluation, and Control) apply to facility assessments. Facility assessment is divided into four main elements:

  Gathering information from available sources.
  Conducting departmental surveys to determine handling, use and storage issues.
  Performing hazard analyses of those work areas with identified risk factors.
  After implementing control measures, conducting periodic surveys to evaluate changes.

- _____ shall conduct a periodic inspection of storage and dispensing locations on a(n) _____ basis to ensure that the requirements of this instruction are being followed.

  - The periodic inspection shall be performed by an authorized employee other than the ones(s) working in the area being inspected.

  - Inspections will be conducted by the following personnel authorized to evaluate storage and dispensing locations:

1. Wilbert Anderson 334-552-1299
2. _____
3. _____
4. _____
5. _____
6. _____

- 4.3.3 The periodic inspection shall be conducted to identify deviations or inadequacies in the program.

- 4.3.4 Inspection Report. This employer shall generate an inspection report detailing the findings of the inspection. The report will be distributed to supervisors and employee's in the chain-of-command of the area being evaluated. The report shall as a minimum identify:

    - The location being inspected.
    - The date of the inspection.
    - The employees included in the inspection.
    - The person performing the inspection.
    - A summary of findings.
    - The date when a follow-up inspection will be conducted.

Spill Control Equipment.

- Spill control equipment will be maintained in each area where storage and/or dispensing is conducted. This equipment will include as a minimum:

  Spill Control Brooms
  Chemical Neutralizers
  Personnel Protective Equipment
  Absorbent Pads
  Shovels, Brooms, Mops, Pails

Employee Training.

- All employees whose duties involved them with flammable and combustible liquids will receive annual training applicable to their areas of responsibility as outlined in the ABC Corporation Training Manual.

- Initial Training. This employer shall provide training to ensure that the purpose and function of this program is understood by employees and that the knowledge and skills required for the safe usage of flammable and combustible liquids is acquired by employees. The training shall include the following:

    - Each affected employee shall be instructed in the purpose and use of these procedures.
    - Each affected employee shall receive training in the recognition and control of applicable hazards.
    - Each affected employee shall receive training in the usage of personal protective equipment.

- All other employees whose work operations are or may be in an area where storage and dispensing is conducted, shall be instructed about the procedures, and prohibitions relating to usage of flammable and combustible liquids.

- Refresher Training.

    - Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new hazard, or when there is a change in these procedures.

    - Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever this employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of these procedures.

    - The retraining shall reestablish employee proficiency and introduce new or revised hazard control methods and procedures, as necessary.

- _____ shall document that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

Handling of Flammable and Combustible Liquids (general requirements).

- Flammable liquids shall be kept in covered containers when not actually in use.

- There shall be no open flames or other sources of ignition within the vapor path of any flammable or combustible chemical used on company premises.

- Transfer of liquids shall be accomplished by using a closed piping system, by gravity through a self-closing valve, or by safety cans.

- The quantity of flammable and combustible liquids in any area should not exceed the amount required for one day or one shift or 120 gallons (NFPA 33).

- *NO SMOKING* signs shall be posted in all locations where flammable or combustible liquids are used or stored. Supervisors shall strictly enforce this policy.

- The transfer of flammable liquids shall be done using appropriate bonding and grounding of containers.

- Containers supplying spray nozzles (i.e., spray guns, etc.) shall be kept closed.

- There shall be no sources of ignition (flame or spark producing) in any area where flammable liquids are used, nor within 20 ft. unless separated by a partition.

- Hot surfaces (steam pipes, etc.) shall not be located in areas where combustible residues may accumulate without approved fire protection controls.

- Electrical equipment located within areas where combustible residues may accumulate shall be approved for Class I Div 1 locations. Electrical equipment adjacent to a spraying area in areas where combustible residues may accumulate and not separated by a partition shall be approved for Class I Div 2 locations.

- Portable lamps shall not be used in any spraying area unless it is specifically designed for a maintenance operation. If used for maintenance, they must intrinsically safe and conform to Class I Div 1 locations.

- Areas using Class I liquids shall be ventilated at a rate of not less than one cubic foot per minute per sq. ft. of floor area.

- Maintenance operations involving hot work or the use of spark producing tools may be done if the area has been proven safe (see hot work/welding safety procedures) and the work is supervised.

- Housekeeping, i.e., cleaning of spills and leakage control. These requirements shall be closely monitored. Supervisors shall strictly control housekeeping in areas where flammable and combustible liquids are used or stored.

- 8Waste or residue shall be stored in approved covered metal containers.

General Requirements for Inside Storage Rooms. Tuskegee University will ensure compliance with the following requirements of 29 CFR 1910.106, 107, 108.

Ensure room is in compliance with the following table:

Fire Protection* Provided	Fire Resistance	Max. Floor Area	Total Allowable Qty Gals/sq ft/floor area
YES	2 hr.	500 sq. ft.	10
NO	2 hr.	500 sq. ft.	4
YES	1 hr.	150 sq. ft.	5
NO	1 hr.	150 sq. ft.	2

*Fire protection system shall be sprinkler, water spray, carbon dioxide or other approved system.

- Where openings to other rooms or buildings exist, they shall be provided with noncombustible liquid tight raised sills or ramps at least 4 in. in height or the room shall be 4 in. below the surrounding floor or an open grated trench draining to a safe location shall be used.

- Openings to rooms shall be provided with approved self-closing fire doors. (Doors may be left open during material handling operations if they are designed to close automatically in a fire).

- Wiring and equipment located inside the storage room shall be approved for Class I of flammable or combustible liquid stored.

- The ventilation inside the room will configured to provide at least six air changes per hour. This will be accomplished either by gravity or mechanical exhaust.

NOTE: In general, if no mechanical exhaust is provided, then it is almost certain that the required exchange rate is not being met. All storage rooms will be reviewed to ensure an air inlet exists and additional NFPA guidelines for proper design of ventilation systems are met.

- If mechanical ventilation exists, it will be controlled by a switch located outside the door. The ventilation and lighting fixtures shall be operated by the same switch.

- If Class I flammables are dispensed, a pilot light (indicator light at switch) will be installed adjacent to the switch to confirm live voltage to the circuit.

- An aisle of at least three feet wide will be maintained for ease of ingress and egress, separation of materials, fire safety and movement of materials.

- Containers over 30 gal. capacity will not be stacked one upon the other.

- Dispensing will be accomplished with the use of approved pumps or if by gravity, then through a self-closing valve.

- A fire extinguisher will be suitably located outside the door of the room.

- No smoking or open flames are allowed in flammable and combustible liquids storage areas.

- Water-reactive materials shall not be stored in the same room as flammable and combustible liquids.

- Adequate warning signs will be installed as required.

- Class I flammable liquids shall not be permitted in basement areas

Drums Storage.

General considerations. Accidents may occur during handling of drums and other flammable and
combustible liquids containers. Hazards include detonations, fires, explosions, vapor generation and physical injury resulting from moving heavy containers by hand and working around stacked

drums, powered industrial trucks and deteriorated drums. While these hazards are always present, proper work practices, such as minimizing handling and using equipment and procedures that isolate workers from such hazardous substances, can minimize the risks to company employees.

Inspection requirements

The appropriate procedures for handling drums depend on the drum contents. Thus, prior to any handling, drums they should be visually inspected to gain as much information as possible about their hazards. Things to look for include:

- Symbols, words or other marks on the drum indicating that it contains flammable or combustible liquids.
- Signs of deterioration such as corrosion, rust, and leaks.
- Signs that the drum is under pressure such as swelling and bulging.
- Drum type.
- Configuration of the drumhead.
- Chemical compatibility with other chemicals in the area.

Handling drums.

The following procedures can be used to maximize worker safety during drum handling and movement:

- Personnel should be trained in proper lifting and moving techniques to prevent back injuries.
- Ensure powered industrial trucks used in the movement of the materials have a rated load capacity high enough to handle the anticipated loads, and make sure the vehicle can operate smoothly on the available road surface.
- Before moving anything, determine the most appropriate sequence in which the various drums and other containers should be moved. For example, small containers may have to be removed first to permit entry and movement of drums.
- Ensure that operators have a clear view when carrying drums. Where necessary, have workers available to guide the operator's motion.

Bulging Drums

11.4.1 Pressurized drums are extremely hazardous. Wherever possible, do not move drums that may be under internal pressure, as evidenced by bulging or swelling.

11.4.2 If a pressurized drum has to be moved, whenever possible handle the drum with a grappler unit constructed for explosive containment. Either move the bulged drum only as far as necessary to allow seating on firm ground, or carefully overpack the drum. Exercise extreme caution when working with or adjacent to potentially pressurized drums.

11.5 Leaking, Open and Deteriorated Drums. If a drum containing a liquid cannot be moved without rupture, immediately contact Anwar Diop at 421-8604 to report a potential spill condition. ***AWAIT FURTHER INSTRUCTIONS!***.

11.6 Grounding and bonding. Buildup of static electricity charges on containers and people is a dangerous source of sparks that can touch off flash fires wherever flammable liquids are being transferred or used.

11.6.1 Grounding. A readily accessible connection to an earth ground will be installed in all company storage and dispensing areas.

11.6.2 Bonding. A readily accessible connection from a grounded drum to a container being filled will be installed on all drums or bulk containers used to dispense flammable or combustible liquids. This procedure is not necessary when self-bonding containers are used. If it is unclear if the container is self-bonding, use a bonding strap in the dispensing process

11.7 Drip pans. Drip pans should be positioned below each drum faucet to catch spills or any possible drippings from a worn or damaged faucet.

11.8 Drum venting Drums containing flammable or combustible liquids will be vented to relieve pressure buildup due to heat and also to prevent creation of a vacuum when liquid is being drained off or the drum is subjected to sudden cooling.

11.9 Drum faucets. Drum faucets will be of the self-closing type. Non self-closing types will not be used by this company.

12. Bulk Storage. Bulk storage of flammable or combustible liquids requires a hazard assessment be conducted to determine specific requirements. Some general rules for each class of chemical include:

12.1 Class I liquids may be stored in closed containers or in storage tanks above ground outside of buildings or underground and maintained in accordance with OSHA, EPA, NFPA and DOT requirements. A site specific assessment must be made.

12.2 Class II and III liquids may be stored in containers or tanks within buildings or in above- or below-ground tanks outside of buildings and maintained in accordance with OSHA, EPA, NFPA and DOT requirements. A site specific assessment must be made.

12.3 If rooms containing Class I liquids are heated it shall be done by the use of steam or hot water or other approved intrinsically safe method. A site specific assessment must be made.

12.4 Ventilation shall be provided for all pumping and dispensing operations taking place within a room. This applies to Class I liquids only. If natural ventilation is not adequate then mechanical ventilation must be used. A site specific assessment must be made.

13. Aboveground Tanks. Local fire inspection personnel will be consulted when determining aboveground tank placement and fire control configurations.

13.1 Spacing (shell-to-shell) between aboveground tanks.

13.1.1 The distance between any two flammable or combustible liquid storage tanks must not be less than 3 feet.

13.1.2 The distance between any two adjacent tanks must not be less than one-sixth the sum of their diameters. When the diameter of one tank is less than one-half the diameter of the adjacent tank, the distance between the two tanks must not be less than one-half the diameter of the smaller tank.

13.1.3 Where crude petroleum in conjunction with production facilities are located in noncongested areas and have capacities not exceeding 126,000 gallons (3,000 barrels), the distance between such tanks must not be less than 3 feet.

13.1.4 Where unstable flammable or combustible liquids are stored, the distance between such tanks must not be less than one-half the sum of their diameters.

13.1.5 When tanks are compacted in three or more rows or in an irregular pattern, greater spacing or other means must be provided so that inside tanks are accessible for firefighting purposes.

13.1.6 The minimum separation between a liquefied petroleum gas container and a flammable or combustible liquid storage tank must be 20 feet, except in the case of flammable or combustible liquid tanks operating at pressures exceeding 2.5 p.s.i.g. or equipped with emergency venting which will permit pressures to exceed 2.5 p.s.i.g. Suitable means must be taken to prevent the accumulation of flammable or combustible liquids under adjacent liquefied petroleum gas containers such as by diversion curbs or grading. When flammable or combustible liquid storage tanks are within a diked area, the liquefied petroleum gas containers must be outside the diked area and at least 10 feet away from the

centerline of the wall of the diked area. The foregoing provisions must not apply when liquefied petroleum gas containers of 125 gallons or less capacity are installed adjacent to fuel oil supply tanks of 550 gallons or less capacity.

13.2 Normal venting for aboveground tanks.

13.2.1 Atmospheric storage tanks must be adequately vented to prevent the development of vacuum or pressure sufficient to distort the roof of a cone roof tank or exceeding the design pressure in the case of other atmospheric tanks, as a result of filling or emptying, and atmospheric temperature changes.

13.3 Normal vents must be sized either in accordance with:

13.3.1 The American Petroleum Institute Standard 2000 (1968), Venting Atmospheric and Low-Pressure Storage Tanks; or other accepted standard; or

13.3.2 Must be at least as large as the filling or withdrawal connection, whichever is larger but in no case less than 1 1/4 inch nominal inside diameter.

13.3.3 Low-pressure tanks and pressure vessels must be adequately vented to prevent development of pressure or vacuum, as a result of filling or emptying and atmospheric temperature changes, from exceeding the design pressure of the tank or vessel. Protection must also be provided to prevent overpressure from any pump discharging into the tank or vessel when the pump discharge pressure can exceed the design pressure of the tank or vessel.

14. Containers And Portable Tanks.

Maximum Allowable Size Of Containers And Portable Tanks

Container type:	Flammable liquids			Combustible liquids	
	Class IA	Class IB	Class IC	Class II	Class III
Glass or approved plastic:	1 pt	1 qt	1 gal	1 gal	1 gal.
Metal (other than DOT drums):	1 gal:	5 gal:	5 gal:	5 gal:	5 gal.
Safety cans:	2 gal:	5 gal:	5 gal:	5 gal:	5 gal.
Metal drums (DOT specs):	60 gal:	60 gal:	60 gal:	60 gal:	60 gal.
Approved portable tanks:	660 gal:	660 gal:	660 gal:	660 gal:	660 gal.

15. Storage Cabinets.

15.1 Maximum capacity. Not more than 60 gallons of Class I or Class II liquids, nor more than 120 gallons of Class III liquids may be stored in a storage cabinet.

15.2 Fire resistance. Storage cabinets used by this company must be designed and constructed to meet NFPA 251-1969 requirements.

15.3 Labeling. Cabinets must be labeled in conspicuous lettering, "Flammable - Keep Fire Away."

16. Storage of Flammable and Combustible Liquids Inside Buildings.

16.1 General. Storage outside buildings must be in accordance with Table H-14 or H-15, §1910.106

16.2 Egress. Flammable or combustible liquids must not be stored so as to limit use of exits, stairways, or areas normally used for the safe egress of people.

16.3 Containers. The storage of flammable or combustible liquids in containers or portable tanks must comply with 29 CFR §1910.

16.4 Office areas. Storage is prohibited except where required for maintenance and operation of building and operation of equipment. Such storage must be kept in closed metal containers stored in a storage cabinet or in safety cans or in an inside storage room not having a door that opens into that portion of the building used by the public.

16.5 Leaking containers. Leaking containers must be removed to a storage room or taken to a safe location outside the building and the contents transferred to an undamaged container.

17. Storage of Flammable and Combustible Liquids Outside Buildings.

17.1 General. Storage outside buildings must be in accordance with Table H-16 or H-17, §1910.106

17.2 Where quantity stored exceeds 1,100 gallons, a minimum distance of 10 feet between buildings and nearest container of flammable or combustible liquid must be maintained.

17.3 Spill containment. The storage area must be graded in a manner to divert possible spills away from buildings or other exposures or must be surrounded by a curb at least 6 inches high. When curbs are used, provisions must be made for draining of accumulations of ground or rain water or spills of flammable or combustible liquids. Drains must terminate at a safe location and must be accessible to operation under fire conditions.

17.4 Security. The storage area must be protected against tampering or trespassers where necessary and must be kept free of weeds, debris and other combustible material not necessary to the storage.

18. Flammable and Combustible Liquids Warehouses or Storage Buildings. The following conditions apply to storage on company property.

18.1 If the storage building is located 50 feet or less from a building or line of adjoining property that may be built upon, the exposing wall must be a blank wall having a fire-resistance rating of at least 2 hours.

18.2 The total quantity of liquids within a building must not be restricted, but the arrangement of storage must comply with Table H-14 or H-15 §1910.106.

18.3 Containers in piles must be separated by pallets or dunnage where necessary to provide stability and to prevent excessive stress on container walls.

18.4 Portable tanks stored over one tier high must be designed to nest securely, without dunnage, and adequate materials handing equipment must be available to handle tanks safely at the upper tier level.

18.5 No pile must be closer than 3 feet to the nearest beam, chord, girder, or other obstruction, and must be 3 feet below sprinkler deflectors or discharge orifices of water spray, or other overhead fire protection systems.

18.6 Aisles of at least 3 feet wide must be provided where necessary for reasons of access to doors, windows or standpipe connections.

19. Fire Control. Extinguishers. Suitable fire control devices, such as small hose or portable fire extinguishers, will be available at locations where flammable or combustible liquids are stored.

19.1 Portable and special equipment. Portable fire extinguishment and control equipment must be provided in such quantities and types as are needed for the special hazards of operation and storage.

19.2 Water supply. Water must be available in volume and at adequate pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems as the need is indicated by the special hazards of operation, dispensing and storage.

19.3 Special extinguishers. Special extinguishing equipment such as that utilizing foam, inert gas, or dry chemical must be provided as the need is indicated by the special hazards of operation dispensing and storage.

19.4 When 2 or more classes of materials are stored in a single pile, the maximum gallonage in that pile must be the smallest of the 2 or more separate gallonages.

19.5 Within 200 ft. of each portable tank, there must be a 12-ft. wide access way to permit approach of fire control apparatus.

19.6 The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 must be doubled.

19.7 When total quantity stored does not exceed 50 percent of maximum per pile, the distances in columns 4 and 5 may be reduced 50 percent, but not less than 3 ft.

19.8 At least one portable fire extinguisher having a rating of not less than 12-B units must be located outside of, but not more than 10 feet from, the door opening into any room used for storage.

19.9 At least one portable fire extinguisher having a rating of not less than 12-B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.

19.10 Sprinklers. When sprinklers are provided, they will be installed in accordance with NFPA requirements.

19.11 Open flames and smoking. Open flames, ignition sources and smoking are not be permitted in flammable or combustible liquid storage areas.

19.12 Water reactive materials. Materials which will react with water must not be stored in the same room with flammable or combustible liquids.

19.12.1 Flammable liquids must be kept in covered containers when not actually in use.

19.12.2 Where flammable or combustible liquids are used or handled, except in closed containers, means will be provided to dispose promptly and safely of leakage or spills.

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

19.12.4 Flammable or combustible liquids must be drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks is prohibited.

20. Drainage.

20.1 Emergency drainage systems will be provided to direct flammable or combustible liquid leakage and fire protection water to a safe location. This may require curbs, scuppers, or special drainage systems to control the spread of fire.

20.2 Emergency drainage systems, if connected to public sewers or discharged into public waterways, will be equipped with traps or separator.

21. Ventilation.

21.1 Class I liquids must be ventilated at a rate of not less than 1 cubic foot per minute per square foot of solid floor area. This must be accomplished by natural or mechanical ventilation with discharge or exhaust to a safe location outside of the building. Provision must be made for introduction of makeup air in such a manner as not to short circuit the ventilation. Ventilation must be arranged to include all floor areas or pits where flammable vapors may collect.

21.2 Equipment used in a building and the ventilation of the building must be designed so as to limit flammable vapor-air mixtures under normal operating conditions to the interior of equipment, and to not more than 5 feet from equipment which exposes Class I liquids to the air.

22. Special Hazards. Where the need is indicated by special hazards of operation, flammable or combustible liquid processing equipment, major piping, and supporting steel must be protected by approved water spray systems, deluge systems, approved fire-resistant coatings, insulation, or any combination of these.

23. Maintenance. All fire protection systems will be adequately maintained and periodically inspected and tested to make sure they are always in satisfactory operating condition, and they will serve their purpose in time of emergency.

24. Sources of Ignition.

24.1 Adequate precautions must be taken by all employee's to prevent the ignition of flammable vapors. Sources of ignition include but are not limited to open flames; lightning; smoking; cutting and welding; hot surfaces; frictional heat; static, electrical, and mechanical sparks; spontaneous ignition, including heat-producing chemical reactions; and radiant heat.

24.2 Grounding. Class I liquids must not be dispensed into containers unless the nozzle and container are electrically interconnected.

25. Housekeeping.

25.1 General. Maintenance and operating practices must be in accordance with established procedures which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills must be cleaned up promptly.

25.2 Access. Adequate aisles must be maintained for unobstructed movement of personnel and so that fire protection equipment can be brought to bear on any part of flammable or combustible liquid storage, use, or any unit physical operation.

25.3 Waste and residue. Combustible waste material and residues in a building or unit operating area must be kept to a minimum, stored in covered metal receptacles and disposed of daily.

25.4 Clear zones. Ground area around buildings and unit operating areas must be kept free of weeds, trash, or other unnecessary combustible materials.

26. Storage and Dispensing Locations. The following locations have been designated as storage (warehousing) or dispensing locations for flammable and combustible liquids.

Location	**Yes/No Dispensing**	**Yes/No Storage**	**Yes/No Spill Control Equipment**	**Yes/No Emergency Procedures**	**Remarks**
Carver Research Founndation Rm #8	Acid and Flammable Cabinets				
Bowie Hall Rm #23 A	Acid and Flammable Cabinets				

Safe Handling of Acids and Bases

Introduction

Due to the dangers of some acids and bases, it is very important to follow certain guidelines when working with these hazards. There are several steps that can be taken to ensure that you are promoting a safe work environment for you and your employees. Following specific lab procedures, wearing the correct personal protective equipment (PPE) and using proper storage and disposal methods are all essential to accomplishing this goal.

Good Lab Practice

Here are several key tips to practicing safety in the laboratory:

1. Never work in a lab alone.
2. Do not eat, drink or smoke in the lab.
3. Never mouth pipette. Use the actual mechanical devices.
4. Make sure that all Bunsen burners are off before you leave the lab.
5. Wear the correct personal protective equipment (PPE) for the hazard.
6. Always use secondary containment if transporting the acids or bases.
7. Keep the lab clean at all times.
8. Make sure bottles are tightly capped unless they are being heated.
9. If you are using hazardous chemicals, make sure your work is always done inside a laboratory hood.
10. Be aware of the location of spill response equipment.

Personal Protective Equipment

It is very important to wear the correct personal protective equipment (PPE) for your application. Correct eyewear, face shields, gloves, respiratory protection and chemical-resistant clothing are all things that should be taken into consideration when working with acids and bases. If you are dealing with the potential for splash, safety glasses are not sufficient. You need to wear an indirectly vented goggle for splash protection. There are three different types of protective goggles: direct vent, indirect vent and non-vented.

Direct Vent

This type of goggle offers protection from impact only. It allows air to flow in so that fogging does not occur as easily. This is **NOT** a good option for splash protection for that reason. It is possible when handling that the acid or base splash could come in contact with the eye through the vents. It is better to go with an indirect or non-vented goggle when handling acids and bases.

Indirect Vent

This goggle is used for protection against chemical splash. They are “capped” so that air can move freely in and out of the goggle but chemical splash and particles cannot. Because there is not as much space for the air to move, you may want to select a goggle that has an “anti-fog” coating. Indirect vented goggles do not offer protection from fumes or vapors. If you are dealing with fumes or vapors, you must use a non-vented goggle.

Non-Vented

Non-vented goggles are goggles that have no holes for air to flow through. They are used in situations where splash and/or fumes and vapors are present. They often have an "anti-fog" coating so that the goggles will not fog up while you are working.

Face Shields

Eyewear alone will not provide adequate protection from splashes to the face. Face shields protect not only the eye area from chemical splash, but also the rest of the face. Face shields are considered secondary protection and must be worn with safety glasses or goggles.

Hand Protection

When working with acids and bases it is very important to wear hand protection (gloves) that are compatible with the chemicals you are using. If the material is not appropriate for the acid or base, you may have problems with breakthrough or degradation of the glove material. MSDS will tell you exactly which type of glove material is compatible with the chemical. If it does not, it is very important to do the necessary research to determine which material will be compatible. This may require contacting the business which you purchased the gloves from or visiting the Web site of the manufacturer of the glove (most of them have chemical compatibility guides available on their Web sites).

Respiratory Protection

The four most common types of respirators used in applications where acids and bases are present are air-purifying, powered air-purifying, supplied air, and SCBA (Self Contained Breathing Apparatus). The respirator that you choose should be acceptable for the acid or base that you are using and have a NIOSH approval.

Air-purifying respirators can be either full-face or half masks with mechanical or chemical cartridges to filter dusts, mists, fumes, vapors or gases. They are available in three types: disposable, reusable and disposable/reusable.

Disposable air-purifying respirators are intended to be used once or until the cartridge expires. The cartridges are permanently attached and have no replacement parts.

Reusable air-purifying respirators use both replaceable cartridges and parts. *NOTE: The replaceable cartridges and parts must be from the same manufacturer to retain a NIOSH approval.*

Disposable/reusable air-purifying respirators have few or no replacement parts except cartridges. When using air-purifying respirators, it is necessary to use cartridges that are going to be compatible with the acid or base you are working with. These cartridge types include:

Organic Vapors: Organic vapor cartridges are black in color and protect against organic vapors (compounds with carbon in them).******

Acid Gas: Acid gas cartridges are white in color and protect against chlorine, chlorine dioxide, hydrogen chloride and sulfur dioxide.******

P100: P100 cartridges are purple in color and it filters out particulates and aerosols (.3 microns in size or larger) at a 99.97% efficiency rate.

**** A chemical cartridge respirator may only be used for exposure levels not exceeding (10X) the OEL (Occupational Exposure limit) as established in 29 CFR 191.134 (d)(3)(iii) (B)(2). If the exposure level exceeds the OEL, then a supplied air respirator must be used.**

Powered air-purifying respirators use a blower to pass the contaminated air through a filter. The purified air is then delivered into a mask or hood. They filter dusts, mists, fumes, vapors and gases, just like ordinary air-purifying respirators. Powered air-purifying respirators would need to be used if the person has facial hair. Having facial hair can affect the fit of an air-purifying negative air respirator and that is why a powered air-purifying respirator would be selected.

Air-purifying respirators cannot be used in oxygen-deficient atmospheres or others deemed IDLH (Immediately Dangerous to Life and Health), which can result when another gas displaces the oxygen or consumption of oxygen by a chemical reaction. Oxygen levels below 19.5% are considered to be oxygen deficient and require a source of supplied air such as an airline respirator with escape bottle or SCBA (CFR 1910.134(d)(2)(i)(a) and 1910.134(d)(2)(i)(b).

Supplied-air respirators provide the highest level of protection against highly toxic and unknown materials. Supplied air refers to ***self-contained breathing apparatuses*** (SCBAs) and ***air-line respirators***. SCBAs have a limited air supply that is carried by the user, allowing for good mobility and fewer restrictions than air-line respirators.

Air-line respirators have an air hose that is connected to a fresh air supply from a central source. The source can be from a compressed air cylinder or air compressor that provides at least Grade D breathing air.

Emergency Escape Breathing Apparatuses (EEBAs) provide oxygen for 5, 10 or 15 minutes depending on the unit. These are for emergency situations in which a worker must escape from environments immediately dangerous to life or health (IDLH).

Chemical-Resistant Clothing

Depending on the concentration of the acid and base that you are using, chemical-resistant clothing may be required. A standard lab coat may not provide enough protection for you. If

concentration levels are high enough, you may even need to wear a suit that is fully encapsulated. Check your MSDS to see if there is a specific type of protective clothing required for your acid or base. If that information is not on the MSDS, try contacting the manufacturer of the chemical or the place where you purchased the acid or base.

Storage of Acids and Bases

There are several factors that should be taken into consideration when storing acids and bases. First and most important, is to make sure that acids and bases are not stored together. If there were to be a spill, chemical reactions could occur if they are stored in the same storage area. Second, make sure you check the MSDS of the acid or base to determine you are not storing incompatible chemicals together.

Also, be aware that all containers are properly labeled so that identification can be achieved as easy as possible. You should be paying close attention to expiration dates, making sure that the acid or base is disposed of on or before the expiration date. Acids and bases should be stored in an acid/base cabinet. The following is a list of some of the most common acids and bases and their specific incompatibilities. As a rule you should not be storing these acids or bases with each other.

Examples of Incompatible Acids and Bases	
Acid or Base	**Is Incompatible and Should Not Be Mixed or Stored With**
Acetic Acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene glycol, perchloric acid, peroxides, permanganates
Ammonia (anhydrous)	Mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid (anhydrous)
Ammonium nitrate	Acids, powdered metals, flammable liquids, chlorates, nitrates, sulfur, finely divided organic or combustible materials
Bleach	Acids, ammonia, drain cleaners
Chromic acid	Acetic acid, naphthalene, camphor, glycerol, alcohol, flammable liquids in general
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid (anhydrous)	Ammonia (aqueous or anhydrous)
Nitric acid (concentrated)	Acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide, flammable liquids, flammable gases, copper, brass, any heavy metals
Potassium chlorate	Sulfuric and other acids
Potassium hydroxide	Acids, organic materials, metals and moisture

Sodium Carbonate	Acids, strong bases, strong oxidizers, fluorine, aluminum, zinc, phosphorous pentoxide
Sodium Hydroxide	Acids, aluminum, organ halogen compounds, nitro and chloro organic compounds, flammable liquids, nitro methane, whey solids and nitrous compounds
Sulfides	Acids
Sulfuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate (similar compounds of light metals, such as sodium, lithium)

Disposal of Acids and Bases

1. Complete the Hazardous Material Pick-Up/Shipping Document and submit to the Environmental Safety Officer at diopa@tuskegee.edu.
2. Label the container as to its contents. ADEM Admin. Code r.335-14-3-.01(2 requires a person who generates a solid waste to determine if that waste is a hazardous waste. All waste must be labeled as to its hazardous material, i.e., if "picric acid" is used in an experiment and waste is generated, then the container is labeled as "picric acid waste."
3. A MSDS must be attached to each hazardous container.
4. Place the container in the designated storage area until pick-up. Chemical pick-up is every 120 days.
5. Each area will be notified as to the date and time of pick-up, one week in advance of pick-up.

Adopted:_____
Revised: _____
Date : _____