FAMU-FSU College of Engineering
Project Hazard Assessment Policy and Procedures

INTRODUCTION

University laboratories are not without safety hazards. Those circumstances or conditions that might go wrong must be predicted and reasonable control methods must be determined to prevent incident and injury. The FAMU-FSU College of Engineering is committed to achieving and maintaining safety in all levels of work activities.

PROJECT HAZARD ASSESSMENT POLICY

Principal investigator (PI)/instructor are responsible and accountable for safety in the research and teaching laboratory. Prior to starting an experiment, laboratory workers must conduct a project hazard assessment (PHA) to identify health, environmental and property hazards and the proper control methods to eliminate, reduce or control those hazards. PI/instructor must review, approve, and sign the written PHA and provide the identified hazard control measures. PI/instructor continually monitor projects to ensure proper controls and safety measures are available, implemented, and followed. PI/instructor are required to reevaluate a project anytime there is a change in scope or scale of a project and at least annually after the initial review.

PROJECT HAZARD ASSESSMENT PROCEDURES

It is FAMU-FSU College of Engineering policy to implement followings:

1. Laboratory workers (i.e. graduate students, undergraduate students, postdoctoral, volunteers, etc.) performing a research in FAMU-FSU College of Engineering are required to conduct PHA prior to commencement of an experiment or any project change in order to identify existing or potential hazards and to determine proper measures to control those hazards.
2. PI/instructor must review, approve and sign the written PHA.
3. PI/instructor must ensure all the control methods identified in PHA are available and implemented in the laboratory.
4. In the event laboratory personnel are not following the safety precautions, PI/instructor must take firm actions (e.g. stop the work, set a meeting to discuss potential hazards and consequences, ask personnel to review the safety rules, etc.) to clarify the safety expectations.
5. PI/instructor must document all the incidents/accidents happened in the laboratory along with the PHA document to ensure that PHA is reviewed/modified to prevent reoccurrence. In the event of PHA modification a revision number should be given to the PHA, so project members know the latest PHA revision they should follow.
6. PI/instructor must ensure that those findings in PHA are communicated with other students working in the same laboratory (affected users).
7. PI/instructor must ensure that approved methods and precautions are being followed by :
    a. Performing periodic laboratory visits to prevent the development of unsafe practice.
    b. Quick reviewing of the safety rules and precautions in the laboratory members meetings.
    c. Assigning a safety representative to assist in implementing the expectations.
    d. Etc.
8. A copy of this PHA must be kept in a binder inside the laboratory or PI/instructor's office (if experiment steps are confidential).

Project Hazard Assessment Worksheet				
PI/instructor: Dr. Hooker	Phone #: (850) 410-6463	Dept.: EE	Start Date: 24 Nov 2023	Revision number: 1
Project: 304-FPL Remote Switching			Location(s): FAMU-FSU college of Engineering	
Team member(s): Andrew Lois (ACL), Jacob Ray (JR), Nicholas Haynes (NH), Nick Grant (NG), SirDarius Lomack (SL), and Christian Perez (CP)			Phone #: JR: 386-292-6107 NG: 561-401-2705 ACL: 561-568-5172 CP: 786-300-5812 NH: 770-940-9214 SL: 754-242-2792	Email: ACL: acl20c@fsu.edu JR: jdr18b@fsu.edu SL: skl19b@fsu.edu NG: nhg19@fsu.edu CP: cperez5@fsu.edu NH: ngh19b@fsu.edu

Experiment Steps	**Location**	**Person assigned**	**Identify hazards or potential failure points**	**Control method**	**PPE**	**List proper method of hazardous waste disposal, if any.**	**Residual Risk**	**Specific rules based on the residual risk**
Prototyping, Assembly, Testing	FAMU-FSU college of Engineering	All Team Members	Physical/Slip, Trips, Falls Hazard Loose wires, spools, parts, bolts, boxes could cause tripping, falling, and fall injuries.	Properly organize workspaces to avoid loose parts.	Slip resistant close-toed shoes, awareness	N/A	HAZARD: 1 CONSEQ:A Residual: Low	N/A
Prototyping, Assembly, Testing	FSU college of	All Team Members	Physical Hazard Heavy parts during moving	Instruct workers to carefully move heavy parts and have a plan	Impact/Cut resistant gloves	N/A	HAZARD: 1 CONSEQ: A	N/A

	Engineering		and assembly could cause pinching, crushing, and damage to extremities	when moving them.			Residual: Low	
Prototyping, Assembly, Testing, storage	FSU college of Engineering	All Team Members	Ergonomic Hazard Moving heavy parts into position for assembly or storage could cause unnatural Stretching and Twisting of body which leads to muscle strain and injury	Give workers instruction on safe lifting procedures, using their legs, etc.	Awareness, proper lifting form	N/A	HAZARD: 1 CONSEQ: B Residual: Low	N/A
Prototyping, Assembly, Testing, storage	FSU college of Engineering	All Team Members	Physical Hazard Sharp parts and machined edges could lead to cuts, larger lacerations, and bleeding	Ensure that workers pay close attention and wear protective clothing	Impact/Cut resistant gloves	N/A	HAZARD: 1 CONSEQ: Moderate Residual: Low Med	N/A
Prototyping, Assembly, Testing	FSU college of Engineering	All Team Members	Physical/High Energy Hazard Use of electrical tools and assembly/testing of motors, parts,	Equipment should resist electricity and workers should assess all possible live electricity before working	Electrical resistant gloves	N/A	HAZARD: 2 CONSEQ: B Residual: Low Med	N/A

			power supplies could cause electrical shock					
All	FSU college of Engineering	All Team Members	Slips/Trips/Falls Hazard Use of oils or other fluids as well as general use of shared spaces could lead to slipping on wet floors or tripping over objects left out could cause fall damage	Workers should wear slip resistant shoes and always be aware of their surroundings	Slip resistant close-toed shoes	N/A	HAZARD: 1 CONSEQ: A Residual: Low	N/A
All	FSU college of Engineering	All Team Members	Biological Hazards In any industrial or shared space, mishaps that cause bleeding or other body fluids or injuries that cause oneself to bleed increases exposure to sickness, diseases, and other ailments	Any instances of bodily injury should be assessed, and necessary sanitation will be done	Gloves, Hand sanitizer	N/A	HAZARD: 1 CONSEQ: A Residual: Low	N/A
Prototyping, Assembly, Testing, storage	FSU college	All Team	Crushing Hazards	Make sure workers have a	Awarene ss, proper	N/A	HAZARD: 1	N/A

	of Engineering	Members	Heavy parts moved in/out of storage or assembly areas pose the risk of falling on extremities or other body parts. These parts can crush the body or extremities	firm grip on parts when moving them and ask for help if they need it.	lifting form		CONSEQ: B Residual: Low	
Prototyping, Assembly, Testing	FSU college of Engineering	All Team Members	Entanglement Hazards Use of or testing parts, motors, and equipment poses the risk of entanglement of hair, clothing, and extremities. This can cause ripping, lacerations, pinching, or crushing of body parts, skin, and extremities	Secure loose hair and make sure all body parts and clothing are clear of the motor's operation.	Awareness, well fitting clothing, hair-ties	N/A	HAZARD: 1 CONSEQ: B Residual: Low	N/A
Prototyping, Assembly, Testing	FSU college of Engineering	All Team Members	Physical/Burn Hazard Use of equipment such as 3D printers	Be aware of hot parts and use proper PPE when moving them.	Awareness, heat resistant gloves	N/A	HAZARD: 2 CONSEQ: B Residual:	N/A

			and machining equipment or tools that generate heat such as motors can cause burns on the skin and body				Low Med	
ALL	FSU college of Engineering	All Team Members	Chemical Hazard Use of a shared space or industrial setting poses the risk of unknown substances and chemicals that can irritate the body, skin, eyes, and respiratory system	Make sure to clean stations of substances before and after use. Make sure workers are aware of their surroundings.	Awareness, chemical washing station	N/A	HAZARD: 2 CONSEQ: B Residual: Low Med	N/A
Prototyping, Assembly, Testing	FSU college of Engineering	All Team Members	Strike Hazards Use of power tools during project or high energy release mishaps may cause objects to fly at high velocities and strike people	Workers will wear hardhats and protective glasses when working with tools of any kind	OHSA certified impact safety glasses	N/A	HAZARD: 2 CONSEQ: B Residual: Low Med	N/A
Prototyping, Assembly, Testing	FSU college	All Team	Vibration Hazards	Make sure workers are	Vibration, impact	N/A	HAZARD: 2	N/A

	of Engineering	Members	Use of power tools, or close proximity to other Vibration producing objects may cause nerve damage or desensitized extremities	aware of the dangers of the tools they are using and are properly trained on how to use them.	resistant gloves		CONSEQ: B Residual: Low Med	
Prototyping, Assembly, Testing	FSU college of Engineering	All Team Members	High Energy/Physical Hazards Use of tools, machinery, pneumatics, electrical systems that have the capability to use and store high amounts of energy may rapidly deteriorate or explode. This may cause burns, blunt force trauma, and many other severe injuries	Only certified workers can operate heavy machinery to ensure there is no misuse, and workers will always wear proper PPE	Vibration, impact, electrical, fire resistant gloves	N/A	HAZARD: 2 CONSEQ: C Residual: Low Med	N/A

Principal investigator(s)/ instructor PHA: I have reviewed and approved the PHA worksheet.

Name	**Signature**	**Date**	**Name**	**Signature**	**Date**

_____	_____	_____	_____	_____	_____

Team members: I certify that I have reviewed the PHA worksheet, am aware of the hazards, and will ensure the control measures are followed.

Name	Signature	Date	Name	Signature	Date
Andrew Lois	ACL	12/1/2023	_____	_____	_____
_____	_____	_____	_____	_____	_____

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DEFINITIONS:

Hazard: Any situation, object, or behavior that exists, or that can potentially cause ill health, injury, loss or property damage e.g. electricity, chemicals, biohazard materials, sharp objects, noise, wet floor, etc. OSHA defines hazards as "*any source of potential damage, harm or adverse health effects on something or someone*". A list of hazard types and examples are provided in appendix A.

Hazard control: Hazard control refers to workplace measures to eliminate/minimize adverse health effects, injury, loss, and property damage. Hazard control practices are often categorized into following three groups (priority as listed):

1. **Engineering control:** physical modifications to a process, equipment, or installation of a barrier into a system to minimize worker exposure to a hazard. Examples are ventilation (fume hood, biological safety cabinet), containment (glove box, sealed containers, barriers), substitution/elimination (consider less hazardous alternative materials), process controls (safety valves, gauges, temperature sensor, regulators, alarms, monitors, electrical grounding and bonding), etc.
2. **Administrative control:** changes in work procedures to reduce exposure and mitigate hazards. Examples are reducing scale of process (micro-scale experiments), reducing time of personal exposure to process, providing training on proper techniques, writing safety policies, supervision, requesting experts to perform the task, etc.
3. **Personal protective equipment (PPE):** equipment worn to minimize exposure to hazards. Examples are gloves, safety glasses, goggles, steel toe shoes, earplugs or muffs, hard hats, respirators, vests, full body suits, laboratory coats, etc.

Team member(s): Everyone who works on the project (i.e. grads, undergrads, postdocs, etc.). The primary contact must be listed first and provide phone number and email for contact.

Safety representative: Each laboratory is encouraged to have a safety representative, preferably a graduate student, in order to facilitate the implementation of the safety expectations in the laboratory. Duties include (but are not limited to):

- Act as a point of contact between the laboratory members and the college safety committee members.
- Ensure laboratory members are following the safety rules.
- Conduct periodic safety inspection of the laboratory.
- Schedule laboratory clean up dates with the laboratory members.
- Request for hazardous waste pick up.

Residual risk: Residual Risk Assessment Matrix are used to determine project's risk level. The hazard assessment matrix (table 1) and the residual risk assessment matrix (table 2) are used to identify the residual risk category.
The instructions to use hazard assessment matrix (table 1) are listed below:

1. Define the workers familiarity level to perform the task and the complexity of the task.
2. Find the value associated with familiarity/complexity (1 – 5) and enter value next to: HAZARD on the PHA worksheet.

Table 1. Hazard assessment matrix.

		Complexity		
		Simple	Moderate	Difficult
Familiarity Level	Very Familiar	1	2	3
	Somewhat Familiar	2	3	4
	Unfamiliar	3	4	5

The instructions to use residual risk assessment matrix (table 2) are listed below:

1. Identify the row associated with the familiarity/complexity value (1 – 5).
2. Identify the consequences and enter value next to: CONSEQ on the PHA worksheet. Consequences are determined by defining what would happen in a worst case scenario if controls fail.
    a. Negligible: minor injury resulting in basic first aid treatment that can be provided on site.
    b. Minor: minor injury resulting in advanced first aid treatment administered by a physician.
    c. Moderate: injuries that require treatment above first aid but do not require hospitalization.
    d. Significant: severe injuries requiring hospitalization.
    e. Severe: death or permanent disability.
3. Find the residual risk value associated with assessed hazard/consequences: Low –Low Med – Med– Med High – High.
4. Enter value next to: RESIDUAL on the PHA worksheet.

Table 2. Residual risk assessment matrix.

Assessed Hazard Level	**Consequences**				
	Negligible	Minor	Moderate	Significant	Severe
5	Low Med	Medium	Med High	High	High
4	Low	Low Med	Medium	Med High	High
3	Low	Low Med	Medium	Med High	Med High
2	Low	Low Med	Low Med	Medium	Medium
1	Low	Low	Low Med	Low Med	Medium

Specific rules for each category of the residual risk:

Low:

- Safety controls are planned by both the worker and supervisor.
- Proceed with supervisor authorization.

Low Med:

- Safety controls are planned by both the worker and supervisor.
- A second worker must be in place before work can proceed (buddy system).
- Proceed with supervisor authorization.

Med:

- After approval by the PI, a copy must be sent to the Safety Committee.
- A written Project Hazard Control is required and must be approved by the PI before proceeding. A copy must be sent to the Safety Committee.
- A second worker must be in place before work can proceed (buddy system).
- Limit the number of authorized workers in the hazard area.

Med High:

- After approval by the PI, the Safety Committee and/or EHS must review and approve the completed PHA.
- A written Project Hazard Control is required and must be approved by the PI and the Safety Committee before proceeding.
- Two qualified workers must be in place before work can proceed.
- Limit the number of authorized workers in the hazard area.

High:

- The activity will not be performed. The activity must be redesigned to fall in a lower hazard category.

Appendix A: Hazard types and examples

Types of Hazard	**Example**
Physical hazards	Wet floors, loose electrical cables objects protruding in walkways or doorways
Ergonomic hazards	Lifting heavy objects Stretching the body Twisting the body Poor desk seating
Psychological hazards	Heights, loud sounds, tunnels, bright lights
Environmental hazards	Room temperature, ventilation contaminated air, photocopiers, some office plants acids
Hazardous substances	Alkalis solvents

Biological hazards	Hepatitis B, new strain influenza
Radiation hazards	Electric welding flashes Sunburn
Chemical hazards	Effects on central nervous system, lungs, digestive system, circulatory system, skin, reproductive system. Short term (acute) effects such as burns, rashes, irritation, feeling unwell, coma and death. Long term (chronic) effects such as mutagenic (affects cell structure), carcinogenic (cancer), teratogenic (reproductive effect), dermatitis of the skin, and occupational asthma and lung damage.
Noise	High levels of industrial noise will cause irritation in the short term, and industrial deafness in the long term.
Temperature	Personal comfort is best between temperatures of 16°C and 30°C, better between 21°C and 26°C. Working outside these temperature ranges: may lead to becoming chilled, even hypothermia (deep body cooling) in the colder temperatures, and may lead to dehydration, cramps, heat exhaustion, and hyperthermia (heat stroke) in the warmer temperatures.
Being struck by	This hazard could be a projectile, moving object or material. The health effect could be lacerations, bruising, breaks, eye injuries, and possibly death.
Crushed by	A typical example of this hazard is tractor rollover. Death is usually the result
Entangled by	Becoming entangled in machinery. Effects could be crushing, lacerations, bruising, breaks amputation and death.
High energy sources	Explosions, high pressure gases, liquids and dusts, fires, electricity and sources such as lasers can all have serious effects on the body, even death.
Vibration	Vibration can affect the human body in the hand arm with `white-finger' or Raynaud's Syndrome, and the whole body with motion sickness, giddiness, damage to bones and audits, blood pressure and nervous system problems.
Slips, trips and falls	A very common workplace hazard from tripping on floors, falling off structures or down stairs, and slipping on spills.
Radiation	Radiation can have serious health effects. Skin cancer, other cancers, sterility, birth deformities, blood changes, skin burns and eye damage are examples.
Physical	Excessive effort, poor posture and repetition can all lead to muscular pain, tendon damage and deterioration to bones and related structures
Psychological	Stress, anxiety, tiredness, poor concentration, headaches, back pain and heart disease can be the health effects
Biological	More common in the health, food and agricultural industries. Effects such as infectious disease, rashes and allergic response.

Project Hazard Control- For Projects with Medium and Higher Risks

Name of Project: 304-FPL Remote Switching		Date of submission: 12/1/2023
Team member	**Phone number**	**e-mail**
Andrew Lois	**561-568-5172**	**Acl20c@fsu.edu**
SirDarius Lomack	**754-242-2792**	**Skl19b@fsu.edu**
Jacob Ray	**386-292-6107**	**Jdr18b@fsu.edu**
Christian Perez	**786-300-5812**	**Cjp19e@fsu.edu**
Nick Grant	**561-401-2705**	**nhg19@fsu.edu**
Nicholas Haynes	**770-940-9214**	**Ngh19b@fsu.edu**
Faculty mentor	**Phone number**	**e-mail**
Dr. Jerris Hooker	**850-410-6463**	**Hooker@eng.famu.fsu.edu**

Rewrite the project steps to include all safety measures taken for each step or combination of steps. Be specific (don't just state "be careful").

N/A, all risks determined to be low

Thinking about the accidents that have occurred or that you have identified as a risk, describe emergency response procedures to use.

N/A, all risks determined to be low

List emergency response contact information:

- Call 911 for injuries, fires or other emergency situations
- Call your department representative to report a facility concern

Name	Phone number	Faculty or other COE emergency contact	Phone number
Dr. Jerris Hooker	**850-410-6463**		
Dr. Shayne McConomy	**850-410-6624**		

Safety review signatures

Team member	Date	Faculty mentor	Date
Andrew Lois	**12/1/2023**		
Jacob Ray	**12/1/2023**		
SirDarius Lomack	**12/1/2023**		
Christian Perez	**12/1/2023**		
Nick Grant	**12/1/2023]**		

Report all accidents and near misses to the faculty mentor.