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. Shayne McConomy	Phone #: 850-410-6624	Dept.: Mechanical	Start Date: 03/05/22	Revision number: 2
Project: T518 Yamaha Trash Interceptor			Location(s): FAMU FSU College of Engineering (COE)	
Team member(s): Jonathan Draigh, Emily Haggard, Momahad Kassem, Martin Senf, and Andrew Walker			Phone #: (850)-728-4516	Email: yamahatrashinceptor@admin.my.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**
Wiring/Soldering (motor/solar panels)	College of Engineering	Emily H. Mohamad K. Martin S.	Exposure to hazardous fumes, Burns, and electrocution	Ensure the room is well ventilated	Safety glasses, protective gloves, and fume fan	Soldering waste will be properly disposed of at the college of engineering.	HAZARD: 2 CONSEQ: Minor Residual: Low	All PPE must be applied before the soldering device is turned on.
Coding and CAD	Remote	All team members	Eye strain, Carpal Tunnel	Every 20 minutes of computer use, look at something 20 feet away for at least 20 seconds to prevent eye strain. Take a 5 minutes walk for every hour of continuous computer use.		N/A	HAZARD:1 CONSEQ: Negligible Residual: Low	Proper breaks shall be taken, and timers set to ensure the proper breaks are taken.
Machining materials	College of Engineering Remote	Andrew W. Jonathan D.	Exposure to being injured (cuts, bruises, etc…)	High difficulty metalwork will be done by a machine shop. Metal work done by members will be done with at least one other member present. It will be done in a well ventilated room that has ample lighting.	Safety glasses or face shield Thick leather gloves Long Sleeve protective shirt Long protective pants Close Toe Shoes	Ensure all hands are washed and all work surfaces swept clean of any metal shards.	HAZARD: 2 CONSEQ: Moderate Residual: Medium	SEE BELOW Safety controls are planned by both the worker and supervisor. All PPE must be worn while doing any machining. A second worker must be in place before work can proceed (buddy system). An approval form and a project hazard control form must be

					According to OSHA, safety goggles are expected when the user is subjected to flying particles			approved by both the PI and the safety committee. A second worker must always be present. The work space must have limited workers to ensure a safe environment All PPE must be applied before any equipment is used
Testing	College of Engineering Remote	All team members	Potential Fall Hazard Potential Lifting Hazard Potential injury due to device motion Potential slipping hazard	Wear appropriate clothing Always test with at least one other team member present.	Safety glasses Long Sleeve protective shirt Long protective pants Close Toe Shoes Hard Hat (especially if the device or any testing equipment is above head height)		HAZARD: 2 CONSEQ: Minor Residual: Low med	A second worker must always be present Supervisor or PI must be notified before testing begins All PPE must be applied before any equipment is used testing commences Buddy system will be implemented when testing. Safety shoes must comply with the ASTM F2413-18 M/I/C EH standard

Installation	Storm drain	All team members	Potential slipping hazard Potential lifting hazard Potential injury by the device Electric hazard	Proper PPE Proper administrative controls of the installation process Avoid carrying more than 35 lbs. individually	Wear safety (Steel toe – non-slip – electric hazard protection) boots Protective goggles High visibility vests/jackets Hard hats Protective gloves		HAZARD: 2 CONSEQ: Minor Residual: Low med	Eliminate sources of potential hazards to the surrounding environment. Install administrative controls to hold inexperienced personnel from interacting with the device on-site. Ensure every team member is wearing their PPE. Supervisor or PI must be notified before installation process begins The buddy system will be utilized during installation, to ensure there is always supervision of one another Safety shoes must comply with the ASTM F2413-18 M/I/C EH standard
Assembling	College of Engineering	All team members	Potential Lifting Hazard	Objects over 35 pounds will be	Safety glasses		HAZARD: 1 CONSEQ:	All PPE must be applied before

	Remote			carried by two people.	Metal toe shoes Hard Hat (especially if the device or any equipment is above head height). According to OSHA, protective helmets should be worn when there is potential for injury to the head from falling objects		Minor Residual: Low	any equipment is used Supervisor or PI must be notified before testing begins All PPE must be applied before any testing commences Buddy system will be implemented when assembling. Safety shoes must comply with the ASTM F2413-18 M/I/C EH standard

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	Date	Name	Date
Jonathan Draigh	03/05/22	Mohamad Kassem	03/05/22
Emily Haggard	03/05/22	Martin Senf	03/05/22
Andrew Walker	03/05/22		

Copy this page if more space is needed.

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 (table2) 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.

Project Hazard Control- For Projects with Medium and Higher Risks

Name of Project:		**Date of submission:**
Team member	**Phone number**	**e-mail**
Jonathan Draigh	**(616)558-6628**	**Jzd18@my.fsu.edu**
Emily Haggard	**(405)388-8532**	**Ech18@my.fsu.edu**
Mohamad Kassem	**(850)999-9819**	**Mak20ds@my.fsu.edu**
Martin Senf	**(954)684-9510**	**Mms18cy@my.fsu.edu**
Andrew Walker	**(850)728-4516**	**andrew2.walker@famu.ed**
Faculty Mentor	**Phone number**	
Shayne McConomy	**850-410-6624**	**smcconomy@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").

Wiring and soldering the electrical components of the trash interceptor has a Minor risk. The potential injuries include, but are not limited to electrocution, burns, and fume inhalation. To combat these risks, eyeglasses, masks, and non-loose clothing will be worn. A fan will be used to reduce the fumes, and all electrical equipment will be properly grounded prior to use.

Any cad and coding for the trash interceptor has a Negligible risk. The potential injuries include but are not limited to eye strain and carpal tunnel. To combat these risks proper breaks and stretches will be followed. A timer will be used to ensure that breaks are taken at proper times.

Any metal machining for the trash interceptor has a Moderate risk. The potential injuries include but are not limited to exposure to being pinched, punched, cut, or blinded. To combat these risks proper PPE will be worn before beginning any machining, a second worker must be present for all machine use, and a room that is well ventilated with ample lighting will be used.

Testing for the trash interceptor has a Minor risk. The potential injuries include, but are not limited to fall hazard, lifting hazard, and injury due to device motion. To combat these risks, eyeglasses and non-loose clothing will be worn and a second worker must present for all testing.

Assembling for the trash interceptor has a Minor risk. The potential injuries include, but are not limited to fall hazard, lifting hazard, and injury due to device motion. To combat these risks proper PPE must be worn when applicable during the assembling process. OSHA standards will be followed to determine when certain PPE is needed to worn.

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

If there are any injuries, fires, or an emergency, the first step to be taken is to call 911.
If there are any problems that may concern the facility, we have to contact our department representative.

- Remove the injured person from location of accident if safe to do so
- Call the appropriate authority (supervisor, FSUPD, 911, Poison Control dependent on severity and injury)
- Call emergency contact of injured person and inform them of incident
- Shut down/close off source of injury, if possible, in a safe and controlled manner
- Isolate scene until the responding authority arrives
- Ensure responding authority has all necessary information on the situation and assist them however they may need

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	Team Member	Faculty or other COE emergency contact	Phone number
Macray Simmers	(850) 598-4667	Emily Haggard	Shayne Mcconomy	850-410-6624
Pete Draigh	(616) 450-6355	Jonathan Draigh	Donald Hollett	(850) 410-6600
Eduardo Senf	(305)332-6325	Martin Senf	Jeremy Phillips	(850) 410-6113
Atif Kassem	(850) 300-9785	Mohamad Kassem		
Steve Walker	(850)-544-4815	Andrew Walker		

Safety review signatures

Team member	Date	Faculty mentor	Date
Martin Senf	03/05/2022		
Jonathan Draigh	03/05/2022		
Emily Haggard	03/05/2022		
Mohamad Kassem	03/05/2022		
Andrew Walker	03/05/2022		

Report all accidents and near misses to the faculty mentor.

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.