

Occupational Health & Safety

General Workplace

Hazard Assessment and Controls

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I. Introduction

University of Wyoming (UW) work environments include a variety of jobs, tasks, and activities that present a variety of hazards. Different regulators (e.g., Occupational Health and Safety Administration (OSHA), Environmental Protection Agency (EPA)) require the assessment of hazards in the workplace. This assessment may include physical, chemical, and biological hazards. Once hazards are identified they must be controlled or minimized in order to ensure the safety of the worker. This is accomplished by: 1) Engineering controls; 2) Substitution; 3) Administration controls; and 4) Personal protective equipment. This plan outlines how to conduct a basic hazard assessment and develop a standard operating procedures from the hazard assessment.

II. Purpose

The purpose of this plan is to identify hazards and corresponding control methods in order to minimize the risk of accident or injury along with compliance with health and safety regulations. Once identified, these control methods can be incorporated into a written standard operating procedure for a given task.

III. Scope

This plan applies to all University supervisors, faculty, staff (including students) working with potential health and safety hazards in a general non-laboratory workplace environment. This includes offices, plumbing shops, paint shops, research shops, etc. For all laboratory environments, refer to the Laboratory Hazard Assessment, Controls, and Standard Operating Procedures document.

IV. Definitions

Administrative controls (or work practice controls): Written safety policies, rules, supervision, schedules, and training used with the goal of reducing the duration, frequency, and severity of injury or illness.

Engineering controls: Elimination or reduction in exposure to a chemical or physical hazard through the use or substitution of engineered machinery or equipment. Examples include self-capping syringe needles, ventilation systems such as a fume hood, sound-dampening materials to reduce noise levels, safety interlocks, and radiation shielding.

Faculty: Limited to regular, full-time personnel at UW whose regular assignments include instruction, research, and/or public service as a principal activity, and who

hold academic rank as professor, associate professor, assistant professor or instructor at UW.

Hazard Assessment: Documented process of identifying the hazards associated with a work environment, project, or tasks prescribing relevant control measures and personal protective equipment to reduce the risk of injury.

Instructor: Any person responsible for directing the activities of students in research project work.

Personal Protective Equipment: Devices worn by the worker to protect against hazards in the environment. Personal protective equipment is designed to protect many parts of the body (i.e., eyes, head, face, hands, feet, and ears). Includes specialized clothing or equipment worn by employees for protection against health and safety hazards (respirators, gloves, and hearing protectors are examples). Last resort control when engineering, administrative and substitution do not address the hazard adequately.

Principal Investigator: Scientist in charge of an experiment or research project.

Substitution: Replacing a hazardous chemical or process with a less hazardous one.

Supervisor: Any person responsible for directing the activities of employees, contractors or visitors, including, but not limited to trade supervisors, working leaders, principal investigators (PIs), lab managers, and nurse managers.

UW Representative: An employee of the University of Wyoming who invites or coordinates the activities of visitors, students or volunteers to the campus for a specific purpose or function.

V. Responsibilities

A. Administrators, Deans, Directors, Department Chairs,

1. Provide support and training as needed to assist personnel in developing hazard assessments and appropriate standard operating procedures.
2. Provide staff the time to prepare and review standard operating procedure plans.

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3. Provide support and training as needed to assist personnel conducting hazard assessments and developing appropriate standard operating procedures.

B. Supervisors, Managers, Instructors, Principle Investigators (PIs)

1. Identify and anticipate potential hazards in the work environment, project, or task.
2. Perform a hazard assessment.
3. Develop appropriate standard operating procedures based on the hazard assessment.
4. Ensure that all affected personnel are trained in and understand the standard operating procedures relevant to their job and are given the opportunity to ask questions.
5. Based on identified hazards, ensure affected personnel receive appropriate training.
6. Ensure everyone understands and follows the standard operating procedures.
7. Periodically review and update the hazard assessment and standard operating procedures as needed.

C. Faculty and Staff

1. Attend safety and health training classes related to the nature of the hazards identified by the hazard assessment.
2. Follow the relevant standard operating procedures for their work utilizing identified control measures (i.e., exhaust ventilation and required personal protective equipment PPE).
3. Maintain assigned personal protective equipment by proper cleaning, storage, and replacement as instructed.
4. Report to supervisor any defective hazard controls or personal protective equipment.

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5. Ask questions if instructions do not seem clear and update relevant standard operating procedures as needed with the help from the supervisors/instructors/principal investigators (PIs).

D. Coordination of students, visitors, and volunteers

1. An employee of UW who coordinates the activities of visitors, students, or volunteers for a specific purpose or functions shall follow the procedures in section B above.
2. Visitors and volunteers, follow the procedures in C above.

E. Safety Coordinators

1. Assist in the coordination of hazard assessments and standard operating procedures in a given work area. (e.g., if there are five identical instruments used in three laboratories, only one hazard assessment and standard operating procedure may be needed for all three).

F. Environmental Health and Safety (UW SAFETY)

1. Trains designated employees in how to conduct hazard assessments, identify hazards, and choose appropriate control measures and/or PPE.
2. Provides initial training for specific hazards as required. See the UW SAFETY website for a current listing of classes offered.
3. Assist in the development of standard operating procedures from the hazard assessment upon request.
4. Maintains the hazard assessment plan and ensures that is available for review and available on the UW SAFETY website.

VI. Hazard Assessment Procedure

- A. Attend and successfully complete the Hazard Assessment and Controls training conducted by UW SAFETY.
- B. Set up a time and location for conducting the hazard assessment. Use Appendices A (Hazard Assessment Template), E (Examples of Hazards and Controls), and C (Personal Protection for certain jobs) as additional references in preparing the assessment (i.e., modify as needed).

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Based on the hazards identified and controls chosen, develop standard operating procedures. Refer to Appendix B for an example of a standard operating procedure template.

VII. Training

Training on specific hazards and controls is provided by the department. UW SAFETY provides required and initial training as needed. See the UW SAFETY website at <http://www.uwyo.edu/safety> for a current listing of training classes offered.

VIII. References

- 29 CFR 1910.132 - General Requirements
- 29 CFR 1910.133 - Eye and Face Protection
- 29 CFR 1910.134 - Respiratory Protection
- 29 CFR 1910.135 - Head Protection
- 29 CFR 1910.136 - Foot Protection
- 29 CFR 1910.138 - Hand Protection
- 29 CFR 1910.137 - Electrical Protective Equipment
- 29 CFR 1910 - Subpart 1 Appendix B - Compliance Guidelines for Hazard Assessment and Personal Protective Equipment Selection
- 29 CFR 1910.1030 Bloodborne Pathogens
- 29 CFR 1910.1000 Air Contaminants
- 29 CFR 1910.1450 - Occupational Exposure to Hazardous Chemicals in Laboratories
- Eye and Face Protection – ANSI Z87.1-2015
- Head Protection – ANSI Z89.1-2014
- Foot Protection – ANSI F 2412-05 & F 2413.05
- Safety Eyewash>Showers – ANSI Z358.1-2014

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Appendix A: Hazard Assessment Template (refer to Appendix E for examples of hazards and controls)

Job Title:	Department:		
Date:	Division:		
Description of Job or Task:			
Hazard	Controls	Comments	
Additional Comments:			
Certification: I certify this hazard assessment was conducted according to University Policy and the signatures below indicate acknowledgement.			
Evaluator (print): _____		Evaluator (signature): _____	Date: _____
Supervisor (print): _____		Supervisor (signature): _____	Date: _____

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Appendix B: Standard Operating Procedure Template

Standard operating procedure for _____		
1 Process (if applicable)		
2 Hazardous Materials and Chemicals Used		
3 Environmental/Ventilation Controls		
4 Personal Protective Equipment (PPE)		
5 Special Handling Procedures & Storage Requirements		
6 Spill and Accident Procedures		
7 Waste Disposal		
8. Other Hazards		
Additional Comments		
Certification: I certify this standard operating procedure was written using the hazard assessment done on this operation and the signatures below indicate acknowledgement.		
Evaluator (print): _____	Evaluator (signature): _____	Date: _____
Supervisor (print): _____	Supervisor (signature): _____	Date: _____

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Appendix C: PPE for Certain Jobs

Type of PPE	Activities/ Job Tasks
Eye/Face Protection (includes safety glasses, goggles, face-shields, welding helmets, and laser goggles)	<ul style="list-style-type: none"> • Sawing, cutting, drilling, sanding, grinding, hammering, coppering, abrasive blasting, wood working and pneumatic tools. • Pressurized spraying or high speed pressure cleaning. • Pouring, mixing, painting, siphoning, dip tanks, battery charging, dental and health care. • Installing fiberglass insulation, compressed air or gas operation • Lasers • Cleaning/lubricating sprays • Chemicals
Foot/Leg Protection (includes safety boots, metatarsals, welding boots, leather pants, coveralls, knee-pads, etc.)	<ul style="list-style-type: none"> • Construction, plumbing, building maintenance, trenching, utility work, grass cutting, forklifts, materials handling, welding, cryogenics handling, electrical, chemicals, etc.
Hand/Arm Protection (includes gloves, sleeves, leather gauntlets)	<ul style="list-style-type: none"> • Construction, plumbing, building maintenance, trenching, utility work, grass cutting, materials handling, chemicals, electrical, cryogenics welding,
Head (includes hard hats)	<ul style="list-style-type: none"> • Work stations or traffic routes located under catwalks or conveyor belts • Construction, confined spaces, building maintenance, wiring, work on or near communication equipment. • Construction sites, tree trimming, trenches/excavations.
Hearing (includes ear plugs and ear muffs)	<ul style="list-style-type: none"> • Construction, machining, grinding, sanding, pneumatic equipment, generators, ventilation fans, motors, punch and brake presses, etc.
Respirator (includes HEPA dust masks, ½ face cartridge air purifying, full-face, power air purifying, and air supplied systems)	<ul style="list-style-type: none"> • When work activities or presses emit excessive amounts of gases, vapors, dusts, mists, or infectious agents that could cause harm. Includes welding, health services, painting, infectious agents, applying pesticides, plumbing, etc.

Appendix D: Glove Protection

GLOVE SELECTION CHART

Go to

Factors affecting the breakthrough times of glove materials include (but are not limited to):

- 1) Thickness of glove material
- 2) Concentration of the chemical worked with
- 3) Amount of chemical the glove comes in contact with
- 4) Length of time which the glove is exposed to the chemical
- 5) Temperature at which the work is done
- 6) Possibility of abrasion or puncture.

Some Common Sense Rules for Glove Use

- Select gloves which are resistant to the chemicals being used. Consult the relevant Safety Data Sheet (SDS) which may recommend a particular glove material.
- Select gloves of the correct size and fitting; gloves that are too small are uncomfortable and may tear whereas overlarge gloves may interfere with dexterity. In some cases, such as use of hydrogen fluoride (HF), it is advisable to select gloves that can be removed very rapidly in an emergency.
- Check gloves before use (even new ones) for physical damage such as tears or pin holes and for previous chemical damage. This is especially important when dealing with dangerous materials such as HF.
- When working, it may be advisable to wash the external surface of the gloves frequently with water.
- Some gloves, especially lightweight disposables, may be flammable: keep hands well away from naked flames or other high temperature heat sources.
- Remove gloves in a way that avoids the contaminated exterior contacting the skin.
- Wash hands after removing gloves.
- Dispose of contaminated gloves properly.
- Do not attempt to re-use disposable gloves.
- Never wear possibly contaminated gloves outside of the work place, or to handle computers or telephones.
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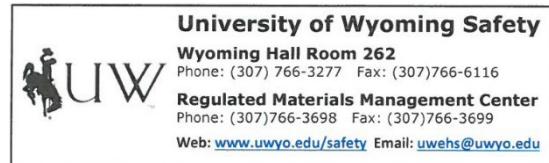
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APPENDIX E: Examples of Hazards and Controls



Hazard	Engineering	Substitution	Administrative	PPE	What to Look For
Physical:					
Impact	Change the way the work is done.				Sources of motion that could result in being hit by objects such as falling objects
Striking energized equipment	Lifting assistance	Use different tools.	Lock-Out/Tag-Out	Use safety glasses, tinted goggles, insulated gloves, hearing protection, fall protection, safety boots, and hard hat. Lead aprons, leather gauntlets, welding helmets, cut-resistant gloves. Correct tools.	Moving machinery such as grinders, drilling machines, engines, motors, pumps, etc.
noise	Keep things clean and uncluttered	Mechanize process	Create standard operating procedures		Sources of sharp objects, moving machinery, or points that could pierce, catch, or pinch the body
pinch points	Exhaust ventilation		Hearing Conservation		Electrical Hazards such as exposed wiring or switches, exposed receptacles, power boxes, damaged tool wiring, etc.
manipulation of large objects	Sloping/Benching		Hot Work Permit		Improper grounding
vibration	Protection methods such as isolation, emergency stops, double hand starts, guarding, and cages		Fall Protection		Work requiring energized electrical components
working at heights	Shielding materials		Radiation badges		Pressurized equipment (i.e., boilers, pots, tanks, piping, hosing, etc.)
hot work			Electrical Safety Program		Material handling equipment components (i.e., hoists, lifts, pneumatics, etc.)
UV light			Do not wear loose clothing and tie hair back		Inadequate clearance
Housekeeping			Monitoring		Elevated work areas over four feet
Trenching/Excavation			Proper body position		Sources of high or low temperature that could result in burns, heat stress, hypothermia or frost bite
Ionizing Radiation, Non-ionizing Radiation (i.e., ultraviolet)			Attend safety training		Sources of electromagnetic radiation such as UV welding emissions, germicidal lamps, lasers, microwaves, and magnets, ionizing sources such as X-rays
Heat Stress/Cold Stress			Follow safe work practices		Sources of sudden release (either physical or electrically) that could harm
Lasers					Uneven surfaces, slippery surfaces and outside ground conditions
Water					Look for water depth and potential for falling into water
Lighting(illumination)					
Ergonomics					
Fire					
Patient transfer					
Broken glass					
Compressed gases					
Burns (welding)					

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Hazard	Engineering	Substitution	Administrative	PPE	What to Look For
Chemical: Liquids, solids, gases, dusts, vapors, and mists comprised of organic or inorganic species Building materials such as asbestos or lead Toxic Materials Controlled Substances Cleaning agents Chemotherapy drugs cryogenic liquids	Local ventilation (i.e., fume hood)	Change process so chemical is not used. Substitute a less hazardous chemical in process.	Respirator Protection Personal Monitoring Attend safety training Safety showers/eye-wash stations	Safety glasses, chemical resistive clothing/aprons, chemical resistive sleeves, gloves, and respirators Lab coats for minimal hazards	Chemical emissions such as smoke, gas, dusts, vapors that are not controlled Sudden unforeseen spills or releases Welding smoke Pass spill evidence Damaged building materials Low potential of splashing versus high potential of splashing Working with low hazard chemicals versus highly toxic chemicals Working with large amounts of chemicals (> 1 liter) Hazardous storage or materials including wastes
Biological: Infectious agent's blood-borne pathogens DNA/RNA work.	Biological safety cabinets. Contamination procedures. Proper design of work area.	Change process so agent or pathogen does not have to be used.	Center of Disease protocols Proper work practices Attend safety training Safety showers/eye-wash stations	Safety glasses, mask, gloves, proper clean-up supplies and disposal.	Safety glasses, mask, gloves, proper clean-up supplies and disposal.