



Department of
Health and Safety

Laboratory Safety

Latest revised date: October 26, 2011	Page 1 of 15
Prepared by: Department of Health & Safety	S-011



Introduction

Memorial University provides a safe and healthy work environment for students, staff, faculty, and researchers who are required to use the lab facilities within the University. The very nature of laboratory activities involves some measure of risk. It is incumbent upon administrators, teaching and research staff, and students to keep these risks to a minimum, not only to protect themselves, but also other building occupants. All reasonable measures will be taken to eliminate injuries and prevent exposure to hazardous materials and to develop, adopt, and teach responsible and prudent laboratory practices that go beyond minimum legislative requirements and standards.

1.0 Purpose

To ensure Laboratory Safety measures are communicated and standardized for all Memorial University owned and operated laboratories.

2.0 Application

This procedure applies to all laboratories owned and/or operated by Memorial University.

3.0 Scope

- Provide general guidelines and basic rules that would be considered the minimum requirement for the safe operation of a laboratory at Memorial University.
- Protect laboratory workers and supervisors from health and safety hazards.
- Define responsibilities of supervisors and those who use laboratory equipment and facilities.
- Provide a standard of safe laboratory practices which allows the University to meet the requirements of the Occupational Health and Safety Act and Regulations.

4.0 Definitions

4.1 Teaching Laboratory

A laboratory where a group of students simultaneously receive instruction in, and perform experimental procedures associated with, a formally approved Memorial University academic course.

4.2 Research Laboratory

A laboratory set up primarily to conduct research and/or to train individuals in advanced laboratory practice.

Latest revised date: October 26, 2011	Page 2 of 15
Prepared by: Department of Health & Safety	S-011

4.3 Supervisor

A person who has charge of a workplace or authority over a worker. At the University this includes all faculty and staff who administer a laboratory.

4.4 Laboratory Worker

At Memorial University this includes all individuals who perform procedures in a laboratory. Some of these individuals may have supervisory functions.

4.5 Hazardous Agent

Any physical, chemical, radioactive, or biological material or product that may pose a health or safety hazard to those exposed.

5.0 General Lab Safety Rules:

- All laboratory personnel must obtain core WHMIS (workplace hazardous materials information system) training and hazard-specific or job-specific training. Core WHMIS training is offered by Memorial each semester. Hazard-specific or job-specific training can be obtained from the Department of Health & Safety and/or from your supervisor.
- Know the location of all safety equipment in the laboratory, such as eye wash, emergency shower, fire extinguishers, fire alarm, telephone, as well as emergency phone numbers.
- Know the correct use of all safety equipment available to you. Keep equipment accessible at all times.
- Wear appropriate personal protective equipment (PPE), e.g. lab coats, proper eye wear, gloves, respirators, and face shields where needed. *Note: latex gloves provide no chemical resistance.*
- Never wear contaminated PPE outside of the lab area.
- Follow all standard operating procedures (SOP's) for the equipment in your lab.
- Consult the material safety data sheet prior to using any chemical and follow the proper procedures when handling, storing, or manipulating them.
- Always be prepared before the commencement of any laboratory experiment. Know specific safety rules and procedures for your lab.
- Be certain that all hazardous materials are stored and labelled properly according to WHMIS requirements and MSDS's. Store only enough chemical necessary for a reasonable period of time. Store in an area only accessible to laboratory personnel. Segregate chemicals where necessary.
- Maintain workplace or WHMIS labels.
- Prepare and Maintain a chemical and equipment inventory for your lab.
- Keep up-to-date MSDS's for all chemicals and mixtures in your lab and make available to all laboratory personnel.

Latest revised date: October 26, 2011	Page 3 of 15
Prepared by: Department of Health & Safety	S-011

- Determine potential hazards and appropriate safety precautions before beginning new lab operations and experiments and confirm that existing safety equipment is sufficient for the procedure.
- Use equipment for its designated purpose and never use equipment if it appears damaged or is not in good working condition.
- Perform regular lab checks on all equipment and remove any defective or broken equipment immediately, e.g., broken thermometer gauge, cracked or chipped glassware, frayed or damaged cords.
- Ensure that the laboratory supervisor is informed about any unsafe condition.
- Ask questions when you are not sure what to do in the lab.
- Never disturb or distract another lab worker when they are engaged in laboratory procedures.
- Never bring food or drinks into the lab. No coffee makers or food preparation equipment are permitted in the lab unless for laboratory purposes.
- Do not mouth pipette. Use mechanical transfer devices at all times.
- No rough housing (horseplay) or pranks in the lab.
- Spills in the laboratory should be cleaned up immediately and with appropriate equipment unless it is an unknown substance or there is a potential for serious injury (explosive, toxic vapors).
- Never try to clean up a spill of corrosive chemical or that which releases toxic vapours without an appropriate respirator.
- Keep appropriate spill kits available in the lab that are fully stocked at all times, e.g., mercury, radiation, biohazardous or for general spills.
- Report all such incidents or accidents to your supervisor, fill out an incident report form and submit it to the Department of Health & Safety.
- Seek medical attention immediately if injured, irritation persists, or if you know or suspect that you have come in contact with a hazardous agent.
- If a spill results in a fire, attempt to extinguish it. If you cannot extinguish it, pull the nearest fire alarm and follow evacuation procedures. Never attempt to extinguish a fire if you feel that your life may be in danger.
- Never block emergency exits, emergency equipment, or an electrical panel.
- Decontaminate any work area that has or may have come into contact with a hazardous chemical.
- Follow proper waste disposal procedures.
- Fill out a Request for Waste Disposal Form and send it to the Department of Health & Safety.
- Segregate waste unless used together in an experiment, e.g., halogenated flammable liquids and non-halogenated flammable liquids, acids and bases, cyanides and acids, etc.
- Label all waste appropriately. Use complete chemical names, no acronyms or abbreviations. Include all chemicals mixed together in a waste container on the label.
- Do not store waste for prolonged periods of time. A maximum of three months will be tolerated. Some chemicals expire before or by this period and some decompose to release hazardous agents or become more hazardous the longer that they are stored.

Latest revised date: October 26, 2011	Page 4 of 15
Prepared by: Department of Health & Safety	S-011

- Do not engage in repetitive motion duties for long periods of time. This type of work can lead to eye, muscle, and/or joint strain.
- Wash hands and arms thoroughly before leaving the lab especially when working with radioisotopes or biohazardous material.
- Replace chemicals to storage areas and turn off any equipment that is not in use when leaving the lab. Practice good housekeeping and chemical hygiene.
- Lock lab at all times when no one is present and restrict access to the lab to authorized personnel. No children or pets allowed.
- No personal equipment should be stored in the lab, e.g., bicycles.
- Ensure that visitors to the lab are equipped with the appropriate safety equipment.
- Do regular, formal laboratory inspections and apply corrective actions. Take part in informal weekly or monthly lab checks.
- Working alone is an unsafe practice. However, if you have to work alone, take measures to ensure that others are aware of your location and have someone check on you periodically.

6.0 Chemical Substances

- 6.1 Memorial keeps under constant review the use or presence of chemical substances at the University that may be hazardous to the health or safety of workers and will, wherever it is reasonably practicable, substitute a safer or less hazardous substance.
- 6.2 Memorial will ensure that where a hazardous chemical substance is present at a workplace, all practicable measures are taken to prevent the exposure of workers to the extent that may be injurious to their health.
- 6.3 The University will take all reasonable steps to ascertain from suppliers the chemical formulation of all chemicals brought into the workplace, the hazards which might arise from its handling or use, and the precautions that need to be taken to ensure the health and safety of workers.
- 6.4 The University will ensure that a substance produced, used, or handled at a lab that, by reason of toxicity, flammability or reactivity, creates risk to the health or safety of workers is contained in a suitable container. The container shall be clearly labeled to identify the substance, the hazards associated with its use or handling, the workplace uses for which it is intended, and protective measures to be taken by workers before, during, and after its use.
- 6.5 Hazardous residue or waste shall be placed into suitably labeled and approved containers for safe disposal.

Latest revised date: October 26, 2011	Page 5 of 15
Prepared by: Department of Health & Safety	S-011

- 6.6 Memorial will prepare, in consultation with the occupational health and safety committee, a list of all chemical substances regularly used, handled, or produced within the University that may be a hazard to the health or safety of workers.
- 6.7 Memorial will ensure that atmospheric contamination of the workplace by chemical substances is kept as low as is reasonably practicable, and in the case of the substances for which a threshold limit value is currently established by the ACGIH, that threshold value shall not be exceeded.
- 6.8 Memorial will ensure that every worker is informed of the nature and degree of health effects of the chemical substances to which the worker is exposed by virtue of his or her work and that the exposure of workers to harmful chemical substances is as little as is reasonably practicable.
- 6.9 Where those working in labs might be exposed to contact with chemicals harmful to the skin, facilities shall be available for workers to effectively cleanse the contaminated body areas. Where corrosive chemicals are involved, emergency water baths, showers, jump tanks, eyewash facilities, or other effective means of treatment shall be readily available.

7.0 Transporting Chemicals

Laboratories use many chemicals that may pose a threat to personal injury when mishandled; therefore, it is best to practice safety with regards to all chemicals in a laboratory.

- Transporting bottles of acids, solvents, or any other liquids should be done with the use of a cart. If a cart is not available for such use, use an approved bottle carrier or transport only one bottle at a time, secured with both hands - one on the neck of the bottle, while the other is placed underneath the bottle. Bottles should not be picked up by the cap or by the glass ring near the neck of the bottle.
- Use a stable cart for transporting chemicals. Do not place bottles near the edge, against each other, or against other glassware during transport. If incompatible chemicals must be transported on the same cart, they should be kept physically separated or placed on separate shelves of the cart.

8.0 Storing Chemicals

Proper chemical storage and awareness of incompatibilities is extremely important in order to maximize personal safety with respect to chemical spills, chemical incompatibilities, and fire or explosion control. Some general chemical storage guidelines include:

Latest revised date: October 26, 2011	Page 6 of 15
Prepared by: Department of Health & Safety	S-011

- Specific instructions on chemical storage may be obtained from the MSDS or on the container label.
- Ensure that all containers are in good condition and are properly labeled, including the date of purchase.
- Store incompatible chemicals separately as opposed to alphabetically. Incompatible chemicals should not be stored in same containment unit or cupboard.
- Ensure that all storage locations are dry and adequately ventilated.
- Secure all storage shelves and cabinets to prevent tipping. Shelves should not be overloaded.
- Liquid chemicals should be stored below eye level.
- Flammable liquids should be stored in approved vented safety cabinets.
- When in use, flammable liquids should be limited to minimal quantities.
- The date of purchase, as well as the date of opening, of all peroxide forming chemical should be indicated on the corresponding container.
- Secure gas cylinders to bench or permanent structure and away from heat sources.
- All chemicals in a lab should have a definite storage place and should be returned to this place after being used.
- Chemicals must never be stored on the floor.
- Appropriate containers, such as those used in experiments, for storage or for waste, should be used according to the type of chemical. Often the MSDS will provide the specific information.
- Containers must be checked often (at least weekly) for any signs of chemical leakage.
- All containers must have caps and covers that are securely in place whenever the container is not in use, and never use cracked or chipped containers.
- Chemicals should be stored as close as possible to the area where they are used in order to minimize the distance that the chemical is transported.
- The following groups of chemicals must be separated from each other: oxidizers and flammables; acids and bases; and acids and cyanides. In the case of acids and bases, they can be stored in the same area but kept physically separated, e.g., use of polyethylene trays to keep them from mixing if a spill occurred. Oxidizers should not be stored on wooden shelves.

9.0 When working with mechanical and hydraulic equipment:

- a. Wear safety glasses when operating or observing machine tools.
- b. Remove rings and other jewelry before operating mechanical equipment.
- c. Do not wear loose clothing while operating a machine.
- d. Contain long hair or use a hair net while operating a machine.
- e. Never leave a running machine unattended.
- f. Open and close all valves slowly.
- g. If any oil is spilled, clean up the oil spills or cover them with absorbent compounds to prevent falls.

Latest revised date: October 26, 2011	Page 7 of 15
Prepared by: Department of Health & Safety	S-011

- h. When working with exhaust producing experiments, make sure that the room is adequately ventilated. Always, open windows and turn on vent hoods or fans.

10.0 When working with electrical equipment:

- a. Use only instruments and power tools that have grounded (three-wire) power cords.
- b. Always shut off power before handling wiring.
- c. Keep shoes dry and avoid standing on metal or damp concrete to prevent yourself from becoming a low impedance path to ground.
- d. Never handle electrical instruments when your skin is wet.
- e. Never leave hot soldering irons unwatched.
- f. If a voltage reading is to be taken using a PC data acquisition system, use a multimeter to verify that the voltage is less than 10 V before connecting the source to the data acquisition system.

11.0 Children and Animals

- 11.1 Children are not permitted in the laboratory. Also, animals not involved in experiments are not allowed in the laboratory.

12.0 Responsibilities:

12.1 Lab Supervisor

The supervisor of a laboratory has overall safety responsibility. Regular, formal safety and housekeeping inspections, utilizing a standard checklist, will be conducted by the supervisor with records of these inspections kept on file. The supervisor is responsible for the following prior to any work being performed by a new laboratory worker:

- Appropriate safety orientation be given to individuals when they are first assigned to a laboratory space;
- All laboratory workers attend the prescribed training provided by the Department of Health & Safety;
- Workers are aware of safety rules and follow them;
- Training on special or unusual hazards in non-routine work has been provided to laboratory workers. A record of this training should be kept on file;
- Adequate emergency equipment in proper working order is readily available;
- Facilities Management will be responsible for checking the same operation of eyewash, safety showers, and fire extinguishers in labs;
- Training in the use of laboratory specific emergency equipment and emergency response has been provided;
- An accident/incident investigation report is completed for every accident or incident which occurs in her/his lab. Examples include: accidents requiring first aid, spills, fires, explosions, and near misses (incidents);

Latest revised date: October 26, 2011	Page 8 of 15
Prepared by: Department of Health & Safety	S-011

- An appropriate alternate is appointed as supervisor when the laboratory supervisor is absent;
- Appropriate cautionary signage be posted (in consultation with OHS); and
- Check for outdated MSDS sheets and ensure MSDS sheets are available for use by workers and/or students.

12.2 Laboratory Worker's Responsibilities

Every laboratory worker is responsible for:

- Following all applicable safety rules and practices as outlined in this procedure and by the supervisor
- Wearing personal protective equipment according to instructions
- Reporting all accidents/incidents to the laboratory supervisor
- Reporting all unsafe conditions to the laboratory supervisor
- Completion of recommended occupational health screening programs as required by legislation
- Attending all applicable training courses offered by the Department of Health & Safety.

13.0 Personal Protective Equipment:

Appropriate PPE must be worn relative to the risks associated with the experiments being conducted in the lab.

13.1 Foot Protection: Shoes must be worn at all times: sandals, high heel shoes, canvas toed shoes, clogs or sling-back shoes, as well as open-toed shoes should be avoided due to the danger of spillage of corrosive or irritating chemicals.

13.2 Head Protection: Long hair should be tied back.

13.3 Lab coats: Lab coats must be worn when working with chemicals to prevent contaminating regular clothing, and from spreading contamination outside the laboratory.

13.4 Hand Protection: It is important to remember that skin contact is a potential source of chemical exposure and that hands are the area most in contact with chemicals. Therefore, precautions to protect yourself must be taken. Such precautionary steps include wearing gloves. Protective gloves come in a variety of types. It is important that the type best suited for your needs be chosen. You can refer to the appropriate MSDS for glove type according to your needs. Also, please note that different glove types have different chemical permeability; therefore, check with the manufacturer before choosing a specific glove type.

Latest revised date: October 26, 2011	Page 9 of 15
Prepared by: Department of Health & Safety	S-011

- Always inspect your gloves for discoloration, punctures, and tears. Rubber and plastic gloves can be checked by inflating with air and placing them in water. If air bubbles are formed, the gloves should immediately be discarded.
- Hot objects should be picked up with gloves made of heat-resistant materials (for example, leather) which should be kept near the vicinity of ovens. Rubber or plastic gloves should never be used to pick up hot objects. Very cold objects (such as liquid N₂ or dry ice) should only be handled when wearing insulated gloves.
- Gloves should be changed often and removed before leaving the immediate work area in order to prevent contamination of oneself, equipment, work area, personal belongings, etc.
- To remove gloves, pull the cuff over the hand.

Latex disposable gloves are not recommended for use with chemicals.

13.5 Eye/Face Protection:

To be effective, protective eyewear must be properly selected and fitted. Safety glasses, goggles, or full face shields must be worn when there is a danger of exposure to a chemical. All safety glasses, goggles, and face shields must meet the requirements of the Eye and Face Protection Standard CSA Z94.3. Safety and Environmental Services will be consulted in determining the most appropriate type of CSA approved protective eyewear, based on the identified risks and recommended protective eyewear in the CSA Selection Guide – Hazards and Recommended Protectors.

Visitors must also follow the eye protection procedure. If they do not provide their own protection, it is the laboratory's responsibility to provide adequate protection. After use, safety glasses/goggles should be cleaned prior to reuse. (See MUN procedure on Eye and Face Protection).

14.0 Contact lenses

- 14.1 Current evidence indicates that the use of contact lenses in the workplace, on the whole, does not place the wearer at additional risk of eye injury. Situations in which the use of contact lenses have minimized or prevented injury far exceed those in which they might have increased or exacerbated injury. This has been attributed to some obvious advantages related to the use of contact lenses, including increased visual acuity and better fit of protective eyewear than with eyeglasses.
- 14.2 Concerns associated with an increased risk of eye injury due to chemical splash or the absorption and retention of gases and vapors by the contact lens materials have not been supported by scientific evidence or human experience. Although there are some chemicals that interact adversely with contact lens materials, there have been many more instances where the contact lenses have been shown to

Latest revised date: October 26, 2011	Page 10 of 15
Prepared by: Department of Health & Safety	S-011

provide a barrier to chemicals. Based on existing evidence, it is reasonable to allow the use of contact lenses in certain chemical work environments. The decision of whether contact lenses will be worn in a specific lab will be a decision of the lab supervisor, in consultation with the Director of the Department of Health & Safety, based on the chemical hazards identified through an objective risk assessment and available guidelines on the use, or prohibited use, of wearing contact lenses while working with select chemicals.

- 14.3 Contact lenses are not protective devices and must be used only in conjunction with appropriate protective eyewear in eye hazard areas (e.g., safety glasses, splash goggles, or a full face shield must be worn in an environment where hazardous liquid chemicals are handled or used).

15.0 “Sample” Laboratory Inspection Checklist

(Note: Regular inspections are to be conducted and documented for all University laboratories. This ‘sample’ checklist is to be used as a guide in the development of lab-specific checklists. Assistance is available from the Department of Health & Safety in the development of lab-specific checklists that ensure required regulatory considerations are incorporated into the checklist).

Warning Signs and information

- Are hazard posters effectively posted at lab entrances?
- Are all emergency and evacuation procedures prominently displayed?
- Are special symbols for radiation, biological or other hazards prominently posted?
- Is the lighting in the laboratory adequate and in good condition?
- Is the temperature in the laboratory well controlled?
- Are the personnel and students using the appropriate footwear, eye protection, laboratory coats, and gloves?
- Are there any water leaks, ceiling tiles removed or stained, wind draft, etc?
- Are the garbage bins being routinely emptied?
- Are the maintenance deficiencies reported to the Work Control Centre?
- Is the information on how to reach Maintenance/Building management posted?
- Are staff and students aware of appointed first-aiders?

Safety Equipment

- Are first aid kits in designated area properly stocked and with their respective lists inside?
- Is a list of current first aid certified personnel posted with or near the first aid kit?
- Have emergency numbers been posted on each phone?
- Are fire extinguishers located in designated area, accessible, and free from obstruction? Are extinguishers fully functional, labeled, and currently updated (e.g., year and date of last inspection indicated on tag)?

Latest revised date: October 26, 2011	Page 11 of 15
Prepared by: Department of Health & Safety	S-011

- Are safety showers and eye wash facilities accessible and free from obstruction?
- Are safety showers and eye wash facilities labelled and inspected periodically for proper function?
- Are fume hoods labeled, working properly, and have they been inspected within the last 12 months?
- Are fume hoods in good condition, sashes open and close, and glass intact?
- Are missing or deteriorating labels being replaced?
- Are emergency switches clearly identified for power and gas supply as well as easily accessible?
- Are compressed gas cylinders properly labeled and certified?
- Are the gas cylinders protected from external heat sources (at least 3m away) and stored in well protected, well vented, and dry location away from high combustible materials?
- Are gas cylinders properly secured in upright position and supported to a rigid structure of the laboratory?
- Are regulators, proper connections, and tubing in good condition?
- Are protective caps in place while gas cylinders are not in use nor connected for use?
- Are specialized trolleys available for moving gas cylinders?
- Are refrigerators and freezers not “explosion proof” or “explosion safe” labeled “No Flammables Allowed”?
- Are refrigerators and freezers labeled for “Chemical Use Only” and used accordingly?
- Are the interiors of refrigerators as well as freezers sound and free of chemical spills or contamination and with containers tightly closed?
- Are microwaves labeled for “Laboratory Use Only” and used accordingly?
- Are electric apparatus equipped with ground plugs or properly grounded?
- Are extension cords in good condition and those for temporary use only not overloaded? Are high voltage equipment labeled, grounded, and insulated?
- Are two prong appliances not within 2m radius or directly located above flammables or sinks?
- Are laboratory apparatus properly assembled and used in a safe manner?
- Is damaged glassware in use (broken, chipped)?
- Are bench tops clean and organized and environs maintained to eliminate harmful exposure or unsafe conditions?
- Are vacuum pump belt guards in place?
- Are the glass dewars wrapped or shielded?
- Are the glass desiccators under vacuum stored in metal guards or shielded?

Chemical Safety

- Is there an updated inventory of chemicals in the laboratory?
- Are the Material Safety Data Sheets available for all chemicals present in the laboratory? Are all chemicals dated upon receipt and all chemicals properly labeled according to WHMIS legislation?

Latest revised date: October 26, 2011	Page 12 of 15
Prepared by: Department of Health & Safety	S-011

- Are all chemical containers well labeled, capped, and in good condition?
- Are all original products named with full chemical names and hazards clearly identified on labels (e.g., “Ethanol, Flammable”) with no confusion or conflicting information?
- Are all containers of non-hazardous substances (e.g., distilled water) labeled explicitly to avoid confusion?
- Are synthesized, unnamed chemicals labeled by their reactants and possible products or by useful generic description and with their probable hazards?
- Are containers of stock solutions properly identified (e.g., buffers labeled and marked as “BUFFERS with specific pH”)?

General Laboratory Storage

- Are all chemicals stored correctly and segregated by hazard (e.g., organic from oxidizers, flammable from acids)?
- Are all chemicals stored according to compatibility and license requirement?
- Are poisons, drugs, carcinogens, etc. kept in locked storage?
- Are corrosive chemicals stored above “eye level”?
- Are chemicals on, above, or next to a desk?
- Are chemicals stored in completely separated storage room from gas cylinders?
- Are all storage refrigerators spark proof or explosion safe?
- Are cabinets used for storage of large quantity containers?
- Is there a security/restricted access to store area? Is fire suppression or fire protection available in the laboratory?
- Are flammables stored in combustible containers (e.g., nalgene)?
- Are there flammable liquid storage cabinets used and adequate for needs?
- Are highly flammable liquids stored away from sources of heat and ignition (including Bunsen burners in fume hoods)?
- Is ventilation sufficient to prevent build-up of offensive odours?
- Is there space to store ‘street’ clothes separate from lab clothes?

Hazardous Waste Disposal

- Are approved methods of disposal for all chemicals in laboratory being used?
- Are there sufficient and appropriate waste containers in laboratory?
- Are the waste containers clearly labeled and the chemicals identified?
- Are the waste containers segregated by compatible storage group system and in secondary container(s)?
- Are waste containers sturdy, routinely inspected for leaks, and kept closed using tight-fitting closure?
- Are waste containers compatible with the chemical waste?

Latest revised date: October 26, 2011	Page 13 of 15
Prepared by: Department of Health & Safety	S-011

Prevention

- Is there an appropriate secondary containment to prevent spread of a major spill?
- Are spill procedures, supplies, and decontaminant materials available where needed?
- Is safety equipment available for use?
- Are chemicals with exposure limits being monitored?
- Does the laboratory have appropriate ventilation for the type of chemicals in use?

Training

- Are personnel and students aware of the procedures in place for use of high-risk chemicals?
- Are personnel and students familiar with spill cleanup requirements for their chemicals?
- Are personnel and students familiarized with potential hazards and good laboratory safety practices?

General biohazard safety

- Are safe work practices in place for laboratory techniques including minimization of aerosols? Are cleaning procedures established for normal cleaning and emergency spill?
- Are autoclave procedures available for disinfection?
- Is biohazard waste treated before disposal?
- Are biohazard waste containers rigid, properly labeled, and with lids?
- Are biohazard waste containers used properly where needed (e.g., autoclave, bags, sharps containers, etc)?
- Are staff aware of established decontamination procedures?
- Have all laboratory personnel and students been provided with information on appropriate vaccination?
- Is specialized personal protective equipment available for use by the laboratory personnel and students?
- Are biological cabinets certified?

Ionizing Radiation

- Are areas designated for specific radiation procedures/works and appropriately registered?
- Is radiation monitoring and detection equipment readily available and calibrated?
- Is contamination monitoring being done?
- Are appropriate personnel and/or area monitoring procedures adopted?
- Is adequate and sufficient shielding material/equipment provided?
- Are radioactive materials securely stored according to regulations?
- Is radioactive waste securely stored and disposed of according to procedures?

Latest revised date: October 26, 2011	Page 14 of 15
Prepared by: Department of Health & Safety	S-011

- Is there an inventory of all radioactive materials and a record of all locations of radioactive emitting sources?
- Are all radioactive waste products being minimized and the volumes of materials designated as radioactive kept to an absolute minimum during storage or handling procedures (particularly in the case of liquid waste)?
- Are all radiation-emitting operations restricted to low traffic areas within the university laboratory?
- Are safe work procedures and decontamination/emergency procedures established?

Non-Ionizing Radiation

- Are all arc-welding operations provided with helmets (w filter lens), fire resistant gauntlet gloves and apron, boots, spats, skull cap and boilermaker's coverall or bib, brace, shirt?
- Do arc-welding areas have ventilation to protect operators from inhaling fumes?
- Do laser laboratories have appropriate warning signs?
- Are lasers equipped with protective housings, safety interlocks, key controls, beam stops, attenuators, and scanning safety guards as appropriate?
- Are the laser operators provided with wavelength specific eye protection?

Legislative reference: OH&S regulations Part VII “Personal Protective Equipment” and Workplace Hazardous Materials Information System (WHMIS) Regulations under the Occupational Health and Safety Act

Latest revised date: October 26, 2011	Page 15 of 15
Prepared by: Department of Health & Safety	S-011