

DRI Laboratory Safety Inspection Form

PI:	Bldg./Room:			
Inspected by:	Date:			
	Y	N	NA	COMMENTS
A. General Work Area				
1. Work area illuminated				
2. Storage of combustible materials minimized				
3. Trash removed promptly by responsible party				
4. Aisles kept clear				
5. General housekeeping in order				
6. Frequently wet surfaces covered with non-slip material				
7. Heavy items stored on lower shelves				
8. Equipment available to reach items above shoulder level				
9. Storage at least 18 inches below sprinkler heads or 24 inches below ceiling if no sprinkler				
10. Exits				
a. Paths free from obstruction				
b. Alternate exits, if available, not blocked				
c. Fire doors not blocked or wedged open				
d. Doors not locked (in direction of travel)				
11. Security/Controls in place and used where required for hazardous materials				
B. Emergency Planning				
1. Fire extinguishers in labs are unobstructed				
2. Fire extinguishers fully charged; tamper indicator in place				
3. Eyewash and safety showers are available, in close proximity and passageway unobstructed				
4. Emergency lights functional (where present)				
5. Eyewash and safety showers are inspected regularly				
6. Spill control materials are available; appropriate kind and adequate amounts for potential spills				
C. Required Information/Postings				
1. Written lab specific response instructions are up-to-date				
2. Materials Safety Data Sheets readily accessible and reflect current inventory.				
3. Written Chemical Hygiene Plan available in lab				
4. Documentation of PPE Hazard Assessment/Training				
5. Telephones posted with emergency stickers				
6. Icemakers posted Not for Human Consumption				
7. Laboratory specific signage posted, i.e., fire extinguishers, showers, eyewashes, etc.				

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A. General Work Environment

1. Depending upon the tasks involved, adequate lighting is provided.
2. Minimize storage of materials that would add fuel to a fire. Examples: paper goods, plastic containers, materials stored in boxes, empty containers.
3. Self explanatory
4. Self explanatory
5. Self explanatory
6. Self explanatory
7. Self explanatory
8. A warehouse ladder, step stool, or some other appropriate means is provided where items are stored above shoulder level.
9. Storage must be at least 18 inches below sprinkler heads, per OSHA 29CFR 1910.159(c) (10); NFPA 13 8.6.6; IFC 315, 21. In areas with no sprinkler system, storage must be at least 24 inches below the ceiling per IFC 315.2.1.
10. Items (a) through (d) - Self explanatory.
11. Certain materials, such as controlled substances, require special security systems or controls to limit access.

B. Emergency Planning

1. Self explanatory
2. Fire extinguishers are inspected monthly by Facilities and results recorded on an attached inspection card. If the fire extinguisher is not fully charged, notify Facilities.
3. Close proximity is within ten seconds travel; can one find it with eyes shut?
4. Self explanatory
5. Safety showers and eye wash stations are inspected and tested at least monthly by Facilities, and the results are recorded on an attached inspection card. Eyewashes should be inspected at least weekly by lab personnel.
6. Laboratory workers should have access to control materials for small spills appropriate to the type and amount of chemicals used or stored in the lab.

C. Required Information/Postings

1. Every laboratory must have an up to date laboratory specific Emergency Action Plan posted as part of their lab specific emergency information.
2. Safety Data Sheets (SDSs) received with chemical shipments must be retained by each laboratory. The EH&S web page has links to several sources of SDSs.
3. Each laboratory unit must prepare and maintain a laboratory specific Chemical Hygiene Plan (CHP), which includes laboratory specific SOP's to complement the DRI Chemical Hygiene Plan.
1. A copy of the DRI CHP must be available to each laboratory at all times. The DRI CHP is maintained by EH&S.
4. Each laboratory unit must complete a hazard assessment to determine which types of Personal Protective Equipment (PPE; e.g. eye and face protection, gloves, etc.) should be used. Workers must receive adequate training on personal protective equipment selection and use. Documentation of the hazard assessment and training must be maintained. Forms are available through EH&S website.
5. Self explanatory.
6. Ice from machines intended to provide ice for experimental purposes are not to be used for consumption because of the potential of such ice to be chemically or biologically contaminated. Signs should be posted at the machine to indicate such special use.
7. Laboratory specific signage must be posted in reference to locations of fire extinguishers, showers, eyewashes, and other lab specific safety instructions.

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	Y	N	NA	COMMENTS
D. Personal Protective Equipment (PPE)				
1. Eye and face protection are available where needed a. Goggles and face shields for corrosives b. Industrial safety glasses for projectiles				
2. Areas requiring the use of eye protection are posted				
3. Open toe shoes prohibited in chemical use areas				
4. Gloves are appropriate for the materials handled				
5. Lab coats available and in use				
E. Electrical Hazards				
1. Flexible cords in good condition				
2. Cover plates in place for outlets and switches				
3. Circuit breaker panels are unobstructed				
4. Machine/instrument access panels are in place				
5. No exposed electrical conductors (> 50 volts)				
6. Multiplug adapters (power strips) have overload protection				
7. No extension cords used for permanent (> 30 day) use				
8. GFI devices used for wet/exterior use				
9. Guards/covers used for high voltage devices				
F. Chemical Storage				
1. Shelving adequate for loads imposed				
2. Laboratory refrigeration units labeled No food or Drink; No Flammable Liquid Storage				
3. Microwaves used for chemicals should not be used for food preparation and are labeled as such				
4. Chemicals stored near sinks are in secondary containment; No chemical storage above sinks				
5. Chemical storage cabinets properly labeled				
6. Containers clearly labeled with complete chemical name and hazard class(es) warnings.				
7. Volatile chemicals not stored in unventilated temperature control chambers, e.g., growth chambers or cold rooms				
8. Containers kept closed except during transfers				
9. Containers compatible with the chemical				
10. Chemicals segregated to avoid incompatibilities				
11. Large/heavy containers stored on lower shelves				
12. Liquid corrosives not stored above eye level				
13. Storage quantities minimized				
14. Secondary containers are used when transporting chemicals				
15. Chemicals which become hazardous upon storage and have a manufacturers expiration date are dated when received and when opened, and disposed of per supplier's recommendations				
16. Chemicals returned to storage areas after use				

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D. Personal Protective Equipment

1. (a), (b) Refer to the laboratory's Personal Protective Equipment Hazard Assessment to determine what type of eye protection should be used.
2. Where eye protection is necessary, Eye Protection Required signs should be posted at the entrance to the area.
3. Self explanatory.
4. There are several weights and types of gloves, make sure the gloves used are appropriate for the job.
5. Self explanatory.

E. Electrical Hazards

1. Electrical cords that have frayed wires or broken insulation present significant electrical shock and fire hazards. Take out of service, and report to Facilities, any electrical cord found to be in poor condition.
1. Cover plates must be installed on all electrical outlets and switches to prevent accidental contact with electrical wires.
2. International Fire Code (IFC) requires a working space of at least 30 inches wide, and 36 inches deep for circuit breaker panels.
3. Self explanatory.
4. Self explanatory.
5. IFC prohibits the use of un-fused multi-plug adapters (e.g. cube adapters and un-fused plug strips) not complying with the International Electrical Code. (IEC)
6. Extension cords may not be used in place of permanent wiring. Additional electrical outlets should be installed to service equipment needs. Fused plug strips may be used for portable equipment providing circuits are not overloaded from that use.
7. Self explanatory
8. Guards or covers should be used for electrophoresis devices operating at 50 volts or more.

F. Chemical Storage

1. Generally, light-duty shelving should not be used. Shelving units should be securely anchored to the wall.
2. To avoid contamination, food should not be stored in refrigerators or freezers used for chemical storage. Signs should be posted on refrigerators and freezers to indicate this.
3. Microwaves in laboratories should be labeled "Not for Food Preparation".
4. To avoid chemicals potentially going down the drain, chemicals should not be stored above or near sinks.
5. Labeling cabinets by chemical class (e.g. flammable liquids, acids, and oxidizers) is required.
6. Chemical containers are clearly labeled with the complete chemical name and hazard class. When a chemical is transferred from the original container, the new container should be labeled immediately. Small containers may use other means of identification.
7. Toxic or flammable substances that are capable of becoming airborne (e.g. gases, vapors, dusts, fumes or mists) should not be used in unventilated areas. Without adequate ventilation, air contaminants can build up to levels that pose health or flammability hazards. Highly toxic gases--fluorine, phosgene, and many semi-conductor gases--should be stored in ventilated cabinets made for this purpose. In the event of a leak or fire, the gas cabinet would contain and exhaust the gas, protecting the laboratory worker from exposure.
8. In order to avoid spillage or release of vapors, containers should be closed except when adding or removing chemicals.
9. Chemicals may degrade certain container materials. For example, hydrofluoric is incompatible with glass. Inorganic hydroxides are best stored in polyethylene containers. Some organic solvents will soften plastic.
10. To minimize hazards associated with incompatible storage, chemicals must be stored in a manner consistent with the storage procedures in the CHP.
11. Self-explanatory.
12. Corrosive materials can cause severe tissue damage and are particularly injurious to the eye. Storage of all chemicals below eye level helps to minimize this risk.
13. Quantities of chemicals in storage should be consistent with the short- term needs of the lab. Excessive storage should be avoided.
14. When transporting chemicals; secondary containers, such as bottle carriers, should be used. In the event the container is dropped, bumped or otherwise breaks, the contents would be contained in the bottle carrier, avoiding a spill. Carts are preferable to hand carrying in corridors and hallways. See guidance documents for details.
15. Self explanatory
16. Self explanatory

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	Y	N	NA	COMMENTS
G. Flammable Liquids				
1. Used in chemical hood or well ventilated area				
2. No more than ten gallons in open use per room/fire control area				
3. Refrigeration units approved for flammable storage if these materials must be kept cold				
4. Flammables separated from strong oxidizers				
5. Flammable liquids not stored or in open use near hot plates or other ignition sources				
H. Compressed Gases				
1. Used in well ventilated areas				
2. Toxic/flammable/corrosive gases used only in a chemical hood or vented gas cabinet				
3. Storage quantities minimized				
4. Secured from tipping while in use or storage				
5. Regulators compatible with cylinder content				
6. Cylinder carts are used for transport				
7. Regulators removed and protective caps are in place when cylinder not in active use				
8. Empty/unused cylinders are promptly placed in designated area for weekly pick up by supplier				
I. Cryogenics				
1. PPE used to avoid eye and skin contact				
2. Used/dispensed with good ventilation				
3. Containers vented or pressure relief devices provided				
4. Low temperature embrittlement considered				
5. Glass Dewars provided with shatterproof protection				
J. Waste Disposal				
1. Containers kept closed except when adding or removing waste				
2. Chemical waste containers are labeled with the words Used or Hazardous Waste as appropriate for content				
3. Constituents of waste are described on the container label or container log sheet				
4. Separate disposal containers available for broken glass				
5. Containers are compatible with waste				
6. Satellite Waste Accumulation Area inspection forms are up-to-date				
7. Waste is segregated by hazard class				
8. Liquid waste containers are kept in secondary containment				
9. Storage of waste is minimized; containers not more than 1 year old				

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G. Flammable Liquids

1. Self explanatory.
2. If the total quantity of all flammable liquids stored in the room exceeds 10 gallons, a flammables storage cabinet must be used. No more than three flammables storage cabinets may be used in one room.
3. Normal household refrigerators must not be used for flammable liquid storage. Laboratory- safe flammable materials refrigerators or explosion-proof refrigerators must be used.
4. Chemical storage must be segregated by hazard class to avoid incompatibilities. The storage of flammable liquids with strong oxidizers creates a fire hazard and should be avoided. See DRI CHP for more information.
5. While true for all container types, this can be especially hazardous when plastic squeeze bottles of flammable liquids are used in hoods where hot plates are also in use.

H. Compressed Gases

1. Self explanatory
2. This does not refer to the cylinder itself. Rather, the delivery point of the gas should be inside a chemical hood or vented gas cabinet.
1. As with the storage of all chemicals, quantities of compressed gas cylinders on-hand should be consistent with the short-term needs of the lab.
2. Compressed gas cylinders must be safely secured in an upright position while in storage or use. Information on the various ways to secure cylinders is available in the DRI CHP.
3. Regulators are designed for use with specific gases, within prescribed pressure ranges. Cylinder valve outlets and inlet connectors on regulators are designed to minimize the chances of using the wrong regulator. If the connections do not readily fit together; the wrong regulator is being used.
4. Large compressed gas cylinders are heavy and difficult to move. A cylinder cart makes the job of transporting cylinders easier and more secure.
5. Cylinders without attached regulators must have valve caps in place. When not in active use regulators are removed and valve caps installed.
6. Disposal of abandoned cylinders is difficult and costly.

I. Cryogenics

1. Loose-fitting, dry gloves, eye and face protection, lab coats and, in some cases, lab aprons may be necessary when using or dispensing cryogenic liquids.
2. Cryogenic liquids produce large volumes of gas when vaporized, which can easily displace breathable air in an enclosed or confined space.
3. Because of the large volumes of gas produced during vaporization, containers for cryogenic liquids should be vented, or closed containers should be protected by pressure-relief devices to avoid over-pressurization. Pressure-relief devices must incorporate both a pressure-relief valve and a frangible disc.
4. Objects that are soft and pliable at room temperature can become hard and brittle at low temperatures and will break easily. Consideration should be given to this whenever materials are used with cryogenic liquids.
5. Dewar flasks or other glassware devices should be taped on the outside or provided with shatterproof protection to minimize flying glass particles in case of implosion.

J. Waste Disposal

1. Except during transfers, Nevada Department of Environmental Protection (NDEP) regulations require that all waste containers be sealed.
2. Self-explanatory - per NDEP regulations.
3. Containers must list contents and approximate percentage composition. Standard chemical nomenclature (common or IUPAC) should be used. Symbols or structural formulas should be avoided.
4. Broken laboratory glassware should be disposed of in a cardboard Glass Waste receptacle. It should not be recycled or disposed of as lab trash.
5. Chemical waste containers should be constructed of materials that will not be affected by the substances that are stored in them. Hydrofluoric acid will etch glass. Acids corrode many metals and some organics will soften plastics.
6. Self explanatory
7. To avoid incompatibilities wastes are segregated by hazard class.
8. Self explanatory
9. To maintain compliance with NDEP regulations, waste must not be allowed to accumulate longer than 1 year. Accumulation of waste can also result in noncompliance due to storing quantities of chemicals over the stated limits. These limits vary with the chemical.

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	Y	N	NA	COMMENTS
K. Ventilation/Hoods				
1. Each chemical hood and other exhaust device has been surveyed within the last year/the survey date has not expired				
2. Chemical hood vents (baffles) are unobstructed				
3. Chemical hoods are used with sash in the lowest position to be able to work effectively; sash never positioned above the arrows affixed during the survey (except for set up or tear down of equipment)				
4. Work is conducted at least 6 inches inside the hood face				
5. Chemical or other storage is strictly limited in actively used hoods				
6. Biosafety and laminar flow cabinets are posted with use limitations				
L. Training/Awareness				
Training:				
1. Workers have attended laboratory orientation				
2. Workers have been provided lab specific safety instruction/training				
3. Workers have had training beyond generic training provided by EH&S				
4. Training (EH&S and laboratory specific) is documented				
Awareness Questions:				
5. How do you clean up chemical spills				
6. Location/content of the Chemical Hygiene Plan				
7. What is an SDS; where to find them and other pertinent safety information				
8. Type of PPE to use and when to use it				
9. What to do with chemical waste				
10. What are the most hazardous materials used and precautions to take				
11. What materials used in the lab are biohazards, carcinogens, highly toxic agents or reproductive toxins				
M. CHP Review				
1. If PHS present in the laboratory; PHS list is available and reflects current chemicals.				
2. Necessary lab specific forms, i.e. SOPs, PHS forms, etc, are in Section 5 of CHP.				
3. Training records are kept for a minimum of 3 years in Section 6 of CHP.				
4. Inspection reports are kept for a minimum of 3 years in Section 7 of CHP.				

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K. Ventilation/Hoods

1. Facilities surveys, annually, each chemical hood, elephant trunk, or other local exhaust ventilation used to control airborne contaminants. Results of the most recent survey are posted on the hood face.
2. Exhaust slots at the rear of the working surface blocked by containers and equipment can adversely affect airflow and compromise containment.
3. When not in active use, hood sashes should be lowered. During chemical manipulations, sashes should be set at or below the position indicated on the survey sticker posted on the hood face.
4. To provide optimum isolation and containment of chemicals and their vapors work is conducted at least 6 inches from the front edge of the hood.
5. Materials should not be stored in a hood that is in active use. The hood is perhaps the most likely site in a lab for a chemical incident to occur. Stored materials can increase the potential for a more serious incident.
6. Volatile organics or hazardous gases should not be used in laminar flow cabinets or biological safety cabinets unless the latter is Class III and has 100% exhaust. Cabinets are posted with this information.

L. Training/Awareness

1. All laboratory workers (including faculty, staff, graduate students, and undergraduates who work independently) must attend EH&S Laboratory Safety Training Orientation.
2. All laboratory workers should receive an orientation, specific to the laboratory they will be working in. This training will include, at least; where the Chemical Hygiene Plan (CHP) is kept, how to use laboratory equipment, how and when to use personal protective equipment, where emergency equipment, such as eye washes and safety showers are, who to contact in an emergency, where SDSs are kept, spill control procedures, emergency procedures and incident reporting.
3. The EH&S Laboratory Safety Training is general in nature and does not cover specific chemicals or experimental procedures. Additional training must be provided by departmental personnel. A summary of this additional training may be found in the CHP.
4. All training, including departmental training and that given by EH&S must be documented. Such records must be kept at least until the laboratory worker leaves DRI.
5. Lab workers should know where spill control materials are stored and how to use them. Basic information about cleaning up chemical spills is covered in Laboratory Safety Orientation. EH&S provides a more extensive training program for departments or groups upon request.
6. A cursory overview of the contents of the model Chemical Hygiene Plan is offered during Laboratory Safety Orientation. More specific information must be given by the Laboratory PI or Manager.
7. An overview of the type of information available in SDSs is given during Laboratory Safety Orientation. The Laboratory PI or Manager must explain where to find SDSs and the protocol for obtaining and maintaining SDSs for the lab.
8. General information about the use of personal protective equipment is discussed in Laboratory Safety Orientation. Specific information about what particular PPE must be used for specific chemicals or processes must be given by the Laboratory PI or Manager.
9. Chemical waste procedures are reviewed in Laboratory Safety Orientation. Specific laboratory procedures must be explained by the Laboratory PI or Manager. More detailed information is provided in the Annual Hazardous Waste Generator Training.
10. Many particularly hazardous materials require special handling, decontamination, disposal, or other precautions. Laboratory workers must have a thorough understanding of the hazards and follow laboratory specific standard operating procedures which incorporate these safety measures.
11. Carcinogens, highly toxic agents, and reproductive toxins are considered particularly hazardous substances. A prior approval process should be in place within the department. This process may include completing a form and receiving special permission from the Laboratory PI or Manager. See the DRI CHP for more information.

M. Review: CHP

1-4 Self explanatory.