

Russ College of Engineering and Technology

Procedure for Oversight of Laboratory and Research Activities

1. PURPOSE

The purpose of this procedure is to communicate the minimum safety requirements and oversight responsibilities necessary to provide a safe environment for our faculty, staff, and students within the laboratories of the Russ College of Engineering and Technology.

2. SCOPE

This procedure is applicable to all Russ College academic and research laboratories and is inclusive of all activities performed on Ohio University's main campus, regional campuses, and off-site research locations.

3. LABORATORY REQUIREMENTS

All academic and research lab spaces must provide the following:

a. *Chemical Hygiene Plan (CHP) and/or Laboratory Hygiene Plan (if no chemicals)*

In order to protect employees from health and safety hazards associated with hazardous chemicals in the laboratory, and in compliance with the requirements of the Occupational Safety and Health Administration (OSHA) Chemical Hygiene Standard, and the Ohio Public Employee's Risk Reduction Act, all laboratory spaces which contain chemicals must provide a CHP. For laboratories where chemicals are not present, a modified laboratory hygiene plan is suitable. Please select the link in the header above to access a template of the latest Russ College Chemical Hygiene Plan which may be downloaded and modified to fit the needs of the lab. This plan must be reviewed by the departmental and/or laboratory chemical hygiene officer, or the PI if none has been assigned, at least annually (provide auditor's name and date of review) and must be located within each laboratory, preferably nearest the primary egress.

b. *Chemical Inventory*

Any space which contains chemicals must be accompanied by an up-to-date chemical inventory. Lubricants, epoxies, solder, flux, industrial cleaners, compressed gases, etc. are considered chemicals and must be included in the inventory. A copy of the inventory must be maintained within the appendix of the CHP. At a minimum, the chemical inventory must include the chemical name, manufacturer's name, quantity, unit of measurement, and location chemical is stored. Information such as expiration (or use by) date, CAS#, and HMIS hazard ratings for health, flammability, and reactivity are useful options to include. Chemicals must be audited at least annually (a physical count of all chemicals) and the person completing the audit must date and initial the chemical inventory when complete. If a laboratory does not contain chemicals, please note "This lab does not contain chemicals" on the applicable page in the appendix of the Chemical Hygiene Plan or Laboratory Hygiene Plan.

c. *Safety Data Sheets (SDS)*

As per OSHA Hazard Communication Standard (HazCom), manufacturers/suppliers are legally required to provide SDS with their products. The SDS format provides a standardized method for communicating the safe handling, storage, use, cleanup, and disposal of a chemical, as well as providing critical health information like the properties of the chemical, the health hazards associated with the chemical, and what Personal Protective Equipment (PPE) may be required to handle the chemical. Anyone who plans to work with a chemical must first read and understand the SDS in its entirety, have the necessary PPE on hand, have a suitable place to store the chemical identified, establish provisions for disposal, etc. before they bring the chemical into the lab space. The SDS is a critical tool for the operation of a laboratory space and must be available to all employees who work in the lab; either digitally via a locally accessible computer or through hardcopies maintained within the lab in the CHP. Note, some agencies (like ABET) require SDS hardcopies be provided in the lab.

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d. *Hazardous Materials Identification System (HMIS)*

The HMIS, originally developed by the American Coatings Association as a compliance aid for the OSHA Hazard Communication (HazCom) Standard, provides a numerical rating system from 0 (least severe hazard) to 4 (most severe hazard) for the categories of health, flammability, and reactivity. An up-to-date chemical inventory and SDS for all chemicals in the lab must be available to complete the HMIS. Please select the link in the header above to download a zipped Microsoft Publisher file, including instructions and pictograms, which you may use to create your own HMIS postings. The HMIS must be printed in color on white paper and be posted outside each door of the laboratory. The HMIS must be updated each time there is a chemical change within the laboratory which results in 1) an increase or decrease of the numerical health, flammability, or reactivity hazard categories, 2) a change in the Personal Protective Equipment (PPE) required within the lab, and/or 3) a change in the hazards of the chemicals stored/used within the lab.

e. *Safety Response Guidelines (SRG)*

All safety related incidents are to be reported, whether they pose an immediate danger or not. The purpose of the SRG is to provide our laboratory employees with the necessary contact information to report an incident should one occur. This emergency call tree should include the names and contact numbers for the principal investigators and/or designates responsible for the laboratory, as well as the department chair who oversees the laboratory, and Russ College leadership. The SRG must be printed on bright yellow paper and be updated each time there is a contact change within the call tree. A copy of the SRG must be posted next to the egress points within each laboratory and should be easily removable by the caller so notifications may be made from a more secure location.

f. *Emergency Contacts*

The name(s) and contact information for the primary Point(s) of Contact (POC) for each space must be posted outside the laboratory. Contact information should include the POC's name, title, office phone number, and mobile phone number. This information is used by first responders, facilities maintenance, university administrators, or anyone who might have questions or concerns regarding the space. Many buildings are equipped with placard holders for this purpose – check with building administration to update this information.

g. *Safety Equipment and Inspections*

All personnel must be familiar with the locations of safety equipment located within the laboratory space. Safety equipment such as eye wash stations, safety showers, first aid kits, and chemical spill kits require monthly inspection by laboratory personnel (provide inspector's initials and date of inspection) to ensure they are in proper working order. Remember, from the eyes of an external auditor if it is not documented, it did not happen.

h. *Training*

As per OSHA HazCom, it is the employer's responsibility to ensure all employees are informed, properly trained regarding the hazards present in their designated work areas, and equipped with (and using) the proper PPE. Therefore, all faculty/staff/students who work within a lab must read and understand the Chemical Hygiene Plan and/or Laboratory Hygiene Plan for their lab space. Furthermore, a listing of all specific laboratory training requirements must be provided and may include a combination of internal and external training. A listing of all required safety procedures specific to the laboratory must also be provided. Safety procedures and training requirements are often provided within the appendix of the Chemical Hygiene Plan.

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- **Academic Lab Training** - It is the responsibility of the course instructor to ensure their students are properly trained to complete lab work as part of their course. Additionally, the safety training received in one course may be a pre-requisite to sign up for a higher-level course.
- **Research Lab Training** – It is the responsibility of the PI to ensure their lab personnel (faculty, staff, and students) have completed all required training before they begin work in the lab. At a minimum, this must include OSHA Laboratory Safety & Hazardous Communication training available through OU's Environmental Health and Safety (EHS) department.

Where employees are asked to work with biological, radioactive, or toxic substances, more advanced training may be required. Please email safety@ohio.edu if you or one of your employees requires advanced training in one of these areas.

- **Biosafety** - All faculty/staff/student employees who work with, handle, or supervise the use of biological materials must first complete Biosafety Training, maintain a separate Biosafety Program Manual, set up the necessary program requirements, and receive approval through the university's Institutional Biosafety Committee.
- **Radiation** - All faculty/staff/student employees who work with, handle, or supervise the use of radioactive materials must first complete Radiation Safety Training, maintain a separate Radiation Safety Handbook, adhere to the necessary program requirements, and receive approval through the university's Radiation Safety Board.

4. SAFETY PLANS

a. *Safety Plan Development*

A Safety Plan is required whenever working with a dangerous process, material, prototype system, or commercial system which has been modified from its original design. The lead researcher should create this Safety Plan in close consultation with the client/PI. For reference, you may download and use the [Russ College Safety Plan Template](#) which incorporates the key features of Design for Safety, Experimental Protocol Development, Standard Operating Procedure (SOP), and the critical function of Failure Modes and Effects Analysis (FMEA) to identify potential hazards. Safety Plans are project specific and, as such, an active research lab will likely have several of these plans in use.

b. *Safety Plan Approval*

The Safety Plan will be reviewed, and the client/PI consulted, as to whether all reasonable hazards have been considered and the necessary safety equipment is present. Once approved by the client/PI, the Safety Plan must be reviewed and approved by the departmental safety officer (often the Chemical Hygiene Officer). In the case where the PI and Safety Officer are one and the same, other non-affiliated reviewers shall be brought in to review the Safety Plan.

If any hazard identified within the FMEA portion of the Safety Plan could result in injury to an employee or damage to the facility (exceeds an initial severity rating of 7 if using the Russ College template), then a Safety Review Committee shall be formed to further evaluate the Safety Plan. The committee must be comprised of no less than three unaffiliated research consultants within the Russ College, who ideally possess experience in a related field or have specialized technical experience beneficial for the evaluation of the design/process. Once approved by the Safety Review Committee, the Safety Plan will be reviewed with a member

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of Ohio University's Safety Department. For details on this review process, please refer to the link [Russ College Safety Plan Approval Process Flowchart](#).

Approved Safety Plans must be posted both in the lab and to the Russ College Safety file share, so they are available for all interested persons to reference. And most importantly, an approved Safety Plan must be in place prior to the start of any experimental work. While approval from the Dean's Office, Department Chair, Russ College Safety Committee, or EHS is not required for every Safety Plan, it is understood that any of these entities have the authority to require a safety plan or call into question an existing Safety Plan should there be perceived safety concerns.

c. Safety Plan Updates

Any significant change (i.e., major component swap, addition/removal of chemicals, parameters of operation, etc.) in a project/process will trigger an update of the Safety Plan requiring another round of approval (although likely more abbreviated).

5. LABORATORY OVERSIGHT

Oversight responsibility for each laboratory or research space will be assigned to a Department, Center, or Institute. Oversight is defined as the organizational level which has the responsibility to review chemical hygiene plans, safety plans, and procedures for that space. Any Department, Lab, Center, or Institute assigned oversight responsibility will have a member on the Russ College Safety Committee. The specific means by which the Department/Lab/Center/Institute oversee their academic and/or research lab spaces is up to them to determine - safety initiatives may be carried out by the PI directly or through a laboratory coordinator, designated safety officer, or even through a safety committee. It must be emphasized that this oversight responsibility carries with it the backing of the Dean and has the power to stop any activity deemed unsafe.

Statement of responsibilities include:

Dean's Office

The Dean, supported by both the Associate Dean for Research and Graduate Education and the Chief Financial and Administrative Officer, is ultimately responsible for the safety initiatives carried out within the Russ College of Engineering and Technology. It is the responsibility of the Dean's Office to establish acceptable safety standards, to confirm commitment to those standards, and to take appropriate action to ensure compliance.

Department Chair

The Department Chair is responsible for all activities carried out within the academic lab space which includes ensuring the Chemical Hygiene Plan, training, safety inspections, and all course-specific training is kept up to date by designated departmental personnel. Additionally, the Chair has oversight responsibility for the activities carried out through the department's affiliated Labs, Centers, and Institutes.

Principal Investigator (PI)

The PI is responsible for all activities carried out within their designated research space(s) which includes ensuring the Chemical Hygiene Plan, training, safety inspections, and project-specific Safety Plans are kept up to date. Furthermore, it is important to note that the PI is responsible for communicating laboratory hazards to their employees. In several high profile cases, the PI has been found legally accountable for injuries sustained by employees while working in their labs. It is

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important to remember that productivity must never take a back seat to safety when the welfare of people is involved.

Laboratory Worker

The Laboratory Worker is responsible for completing all required training, adhering to all laboratory safety directives, reading and understanding all applicable SDS, and following all approved Safety Plans during the course of their work. The Laboratory Worker is also responsible for communicating to their supervisor, or PI, any incidents or near misses that take place, as well as any questions or concerns they have regarding the chemicals they have been asked to use or the work they have been asked to perform. If the employee is uncomfortable expressing these concerns to their direct supervisor, or feel they are not being heard, the employee is encouraged to speak with a safety officer, the Russ College Safety Coordinator, a member of the Safety Committee, or Department Chair.

Russ College Safety Coordinator

The Safety Coordinator is responsible for safety-related support of the academic and research constituents of the Russ College, consultation with lead researchers to develop Safety Plans, and oversight of annual laboratory auditing services to ensure compliance with university and governmental regulations. The coordinator will also maintain a list of all Russ College academic and research lab spaces and their assignments, maintain an up-to-date list of all key Russ College safety personnel, and manage the Russ College Safety Dashboard. Where necessary, the safety coordinator will also assist with safety incidents, help develop corrective actions, and provide follow-up services.

Russ College Lab Safety Committee

The Russ College Lab Safety Committee is comprised of the Chief Financial and Administrative Officer and select faculty and technicians representing academic and research interests from across the Russ College and is responsible for providing safety insight to the constituents of the Russ College. This committee, or a subcommittee thereof, may be called upon by anyone, especially from across research areas, to serve as a resource for input and advice. Committee members often sit on Safety Review Committees to assist with the development of Safety Plans.

Safety Review Committee (ad hoc)

A Safety Review Committee is formed at the discretion of a PI to review a Safety Plan whenever concerns for significant injury to an employee or the facility may occur because of the planned research. This temporary committee is responsible for reviewing the proposed Safety Plan, providing feedback for improvement, and – if the research can be carried out safely by the employees involved, with the correct training, using the correct PPE, in the space assigned, and under the specific conditions/parameters called out within the Safety Plan – issuing approval.

6. CHANGE LOG

When	Who	What
6/1/20	Shy	Significant changes to procedure dated 21 February 2005
8/18/21	Shy	Minor updates to draft procedure
9/9/21	Shy	Training Sect 3h, Safety Plans Sect 4, Laboratory Oversight Sect 5