

Laboratory Specific Appendix I. Standard Operating Procedure Template

Preparing Standard Operating Procedures for Laboratory Activities

Introduction

An important first step in planning laboratory experiments is a comprehensive evaluation of the potential hazards associated with the work. This includes hazards that may be posed by chemicals, biological and radioactive materials, equipment, physical hazards and conditions. This risk analysis should not be divorced from the other components of the planning process, but rather integrated into a single process evaluation. This evaluation should be documented and used a tool for future reference in the form of a Standard Operating Procedure. In most cases SOPs should be developed in a collaborative environment, with the involvement of multiple researchers as opposed to individually.

Elements of a Standard Operating Procedure (SOP)

There are no absolute correct or incorrect methods for developing an SOP, nor is there a single acceptable format. The process is not intended to be about filling out forms; the process, when completed appropriately, ensures that safe work practices have been developed for the experimental work. SOPs can be integrated directly into laboratory manuals or procedural experimental guides, developed for a specific hazard such as an individual chemical or class of chemicals or specific equipment. SOPs can be stand alone documents or supplemental information included as part of research notebooks, experiment documentation or research proposals. SOPs such contain, at a minimum, the following information:

- **Identification:** Identify, specifically, the intended scope of the SOP. The SOP can focus on specific processes and procedures, individual hazardous materials or groups of hazardous materials, equipment and conditions. Circumstances that would require Prior Approval, as discussed in Section 4.5 of the LCHP should also be included.
- **Process Hazards Assessment:** A hazards assessment which details potential hazards associated with the activity/process. This would include hazardous materials, physical hazards, equipment items electrical hazards, lasers etc.
- **Exposure Controls Review:** The hazards assessment information should be utilized to consider potential exposures using the four “routes of exposure” as a foundation.
- **Engineering Controls:** A detailed description of the engineering control requirements of the process/procedure along with a method of ensuring proper operation and efficacy.
- **Personal Protective Equipment:** A detailed description of the Personal Protective Equipment requirements of the process/procedure along with the location of supporting reference information.
- **Storage and Handling Requirements:** Detail storage requirements for hazardous materials and process handling issues specific to the procedure.

- **Proficiency and Authorization:** The training requirements for the specific procedure, or piece of equipment should be clearly defined, along with a mechanism to ensure proficiency within the laboratory. Specific procedures for access control and authorization during the procedure should also be outlined.
- **Waste Management:** Outline waste materials to be generated and appropriate waste management procedures for the work.
- **Decontamination Procedures:** Specific methods for decontamination/cleaning appropriate to the work being completed should be included.
- **Emergency Procedures:** Detail the specific procedures to be followed if emergency situations arise from the process/procedure. These steps will be based on the hazard assessment and controls sections.

The Office of Environmental Health and Safety can assist in the development of laboratory specific SOPs. An SOP template and an example of an experimental review and completed SOP have been provided for your consideration.

Laboratory Standard Operating Procedure-Risk Assessment

Section 1: Identification

Laboratory Group Name:

Lab Specific ID#

Lab Location:

PI/Lab Supervisor:

Date SOP Created:

Date SOP Revised:

Type of SOP:

Procedural Hazardous Material Equipment Specific Other

Prior Approval Required (As outlined in the LCHP Section 4.5) Yes No

Specific Scope of this SOP:

Section 2: Process Hazards Assessment

Hazardous Materials-Chemical

Not Applicable



Describe:



Describe:



Describe:



Describe:



Describe:



Describe:

Section 2: Process Hazards Assessment

Hazardous Materials-Biological Not Applicable



Describe:

Hazardous Materials-Radiological Not Applicable



Describe:

Physical and Equipment Hazards Not Applicable

Glassware

Compressed Gases

High/Low Pressures

Electrical

Electromagnetic

High/Low Temperatures

Centrifuge

Autoclave

Vacuum

Lasers

Microwaves

Rotary Evaporator

Open Flame

Elevated Noise

Soldering/Welding

Oil Bath

Heat Guns

Heating Mantles

Hot Plate

Ultrasonicators

Stirring/Mixing Device

Moving Parts

Puncture Hazards

Hand/Power Tools

Flying Particles

Oversized Objects

Heavy Objects

Elevated Height

Ovens/Furnaces

Computer Work

Other Describe:

Other Describe:

Other Describe:

Other Describe:

Other Describe:

Other Describe:

Section 3: Exposure Controls Review

- Inhalation Hazards Describe
 - Absorption Hazards Describe:
 - Ingestion Hazards Describe:
 - Injection Hazards Describe:
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Section 4: Engineering Controls

Chemical Fume Hood Certification Date:
Biological Safety Cabinet Certification Date:
Laminar Flow Hood Certification Date:
Perchloric Acid Hood Certification Date:
Glove Box Localized Ventilation Shielding Guarding
Other Describe:

Other Describe:

Other Describe:

Section 5: Personal Protective Equipment

Laboratory Coat Tyvek Suit Chemical Apron
Safety Glasses Face Shield Flame Retardant Clothing
Laser Goggles Welding Shield Chemical Splash Goggles
Gloves Type:
Respiratory Protection Type:
Hearing Protection Type:
Other Describe:
Other Describe:
Other Describe:

Section 6: Storage and Handling Requirements

Not Applicable

Describe

Section 7: Proficiency and Authorization

Not Applicable

Describe

Section 8: Waste Management

Not Applicable

Describe

Section 9: Decontamination Procedures

Not Applicable

Describe

Section 10: Emergency Procedures

Describe

Notes/Comments