# Cornell University Seal

 **SOP**

# Scope and Purpose

Use this template to develop a lab specific standard operating procedure for the purchase, storage and use of hazardous gases. This should include a description of the research that uses the gas or gases. Also, identify who or what the Standard Procedure applies to, e.g., all units of Cornell, administration, controlled documents, etc.

# Location

Provide floor plans and identify the specific location in the building the gas/gases are located. Include equipment that the gas serves, monitoring system detection points and emergency exits.

# References

Include relevant definitions, other related documents or Standard Procedure or Job Plan titles and numbers that are referenced in or relevant to the Standard Procedure, and any additional resources or references, such as the gas detection operator manual and/or the location of such documents.

# Hazardous Gas Classifications

Describe the types of gases with concentrations, cylinder details, and hazard classifications determined during the code review. A copy of the code review can be obtained by Facilities Engineering.

# Equipment Description

Describe the laboratory equipment that the gas serves. Include other hazardous materials that the system uses, including lasers or chemicals.

# Responsibilities

Outline individuals’ responsibilities for activities within the standard operating procedure. Describe responsibilities by role.

## Principle Investigator

The PI leads the completion of this standard operating procedure including:

* Establishment and maintenance the program manual
* Responsibility for adherence to the procedure
* Training laboratory workers on proper handling and use of the gases being managed by the group
* Etc.

## Unit Representative

The Unit Representative may be the Department Safety representative, Building Coordinator, Safety Manager or Environmental Health and Safety who shares responsibility for operation and maintenance of gas system:

* Implement x procedure within the unit
* Etc.

## Laboratory workers

* Obtain the necessary training for the safe handling and use of hazardous gases located in the lab
* Keep necessary records for calibration and maintenance of the gas monitoring system

# Gas System Design

## Gas Cabinet operation

### Ventilation requirements

### Cylinder replacement procedure

### Inert gas purge operation

### A flow chart can be used to visually illustrate the steps of the control measures.

### Etc

## Performance Based Control Measures

### This should identify control measures, such as restrictive flow orifices, purchasing controls (prior approval, cylinder size restrictions, etc)

### Etc

## Preventive Maintenance

### Have the building coordinator call customer service at least 24 hours in advance to schedule a fire alarm shut down for the gas points in the room. This must be coordinated with EHS as a temporary status and return to normal operation after a certain period of time or another call made when maintenance is completed.

### Function check of the gas sensors (Bump test): This is a qualitative function check in which a challenge gas is passed over the sensor(s) at a concentration and exposure time sufficient to activate all alarm settings. The purpose of this check is to confirm that gas can get to the sensor(s) and that all the instrument's alarms are functional. The bump test or function check does not provide a measure of the instrument's accuracy. But, should trigger the alarms. This should be performed according to manufacturer’s recommendations and a record of this should be kept that includes who conducts the test. New sensors should be bump tested within 2 days to be sure they function properly.

The gas sensors have a life span that cab be between 6 months and 10 years. In some systems a code is sent to the panel when this reached. Check the operator manual for how users are notified in the event of a sensor failure.

### Verification of calibration or full calibration: What is the frequency recommended by the manufacturer? What other situations or notices would trigger the need for calibration? What records must be maintained?

# Emergency Procedures

Hazardous gases stored in ventilated cabinets require gas detection that may be connected to the fire alarm system of the building. The University standard for gas detection is established in the Hazardous Gas Standard. However, there may be 2 levels of notification are sent through this system in the event of a leak or loss of ventilation for a flammable gas, for example. These include a “supervisory” signal at 20% of the Lower Explosive Limit (LEL) and an “alarm” level at 40% of LEL of the gas. Emergency procedures must identify what occurs at each alarm level and how to respond. Other situations to include in emergency procedures would be:

* How do you respond if you smell something or otherwise suspect a gas leak?
* When should the fire alarm pull switch in the hallway be activated and what happens when it is?
* What other notifications is the gas system equipped with?
	+ Annunciation
	+ Strobe light
* Contact Information of employees responsible for lab: Principle Investigator, lab manager, lead graduate students, etc.

Example of emergency exit of building:

1. Exit the room
2. Contact CU Police by:
3. Using the emergency call box located at the stairwell or the loading dock
4. Using your cell phone to call (607) 255-1111
5. Using a wired phone to call 911
6. Tell the dispatcher who are you are and where you are located (which building including physical address)
7. Wait for emergency responders outside of the area.

## Definitions

For the purposes of this document, the following definitions apply:

* Include definitions for words that need to be clarified to understand this procedure. For example:

## Related Documents/Procedures

* List document titles and links to related documents, procedures and job plans, Safety Data Sheets