

Chemical Safety Program

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Institutional Chemical Hygiene Officer

Chemical Safety Program Manager



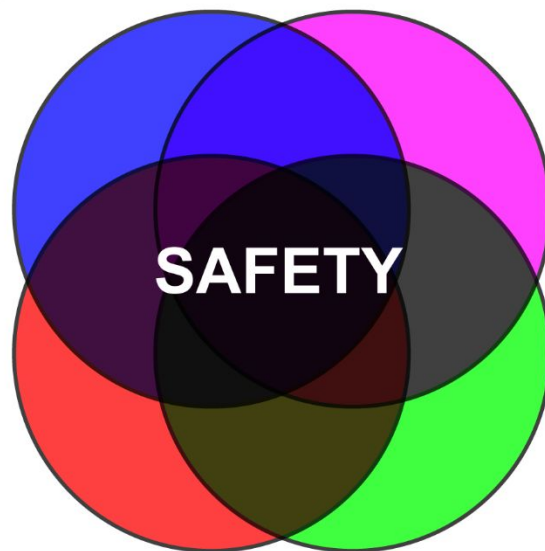
Overview

- Responsibilities
- Chemical Hazard Communication
- Classes of Hazardous Chemicals
- Reducing Exposure to Hazardous Chemicals
- Chemical Exposure Assessment
- Inventory, Labeling, Storage, and Transport
- Training
- Inspections and Compliance
- Hazardous Waste Management
- Accidents, Emergencies, and Chemical Spills

Responsibilities

Principal Investigator/
Laboratory Supervisor

Shared Facility Staff



Researcher/
Laboratory Worker

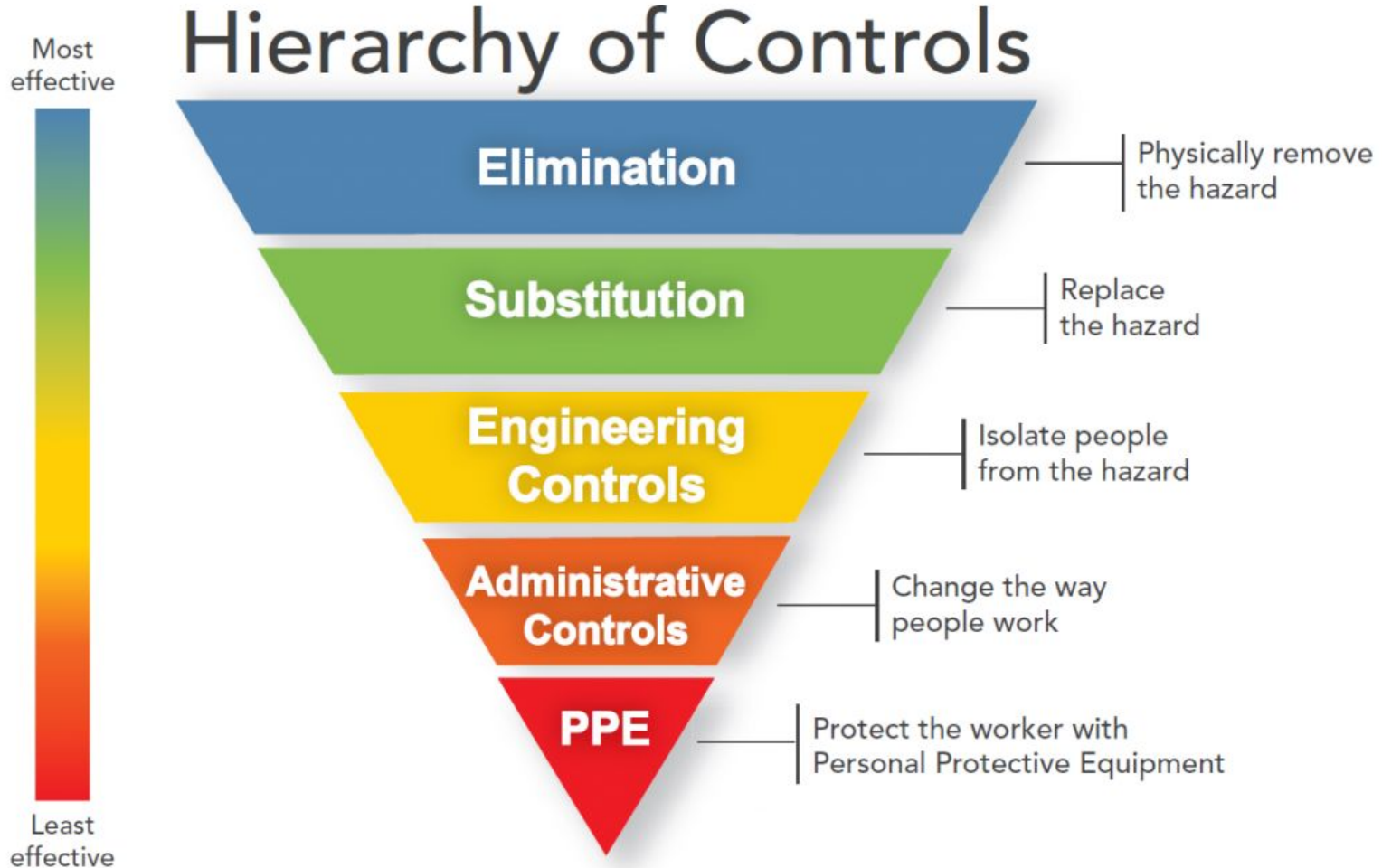
EH&S

Chemical Hazard Communication

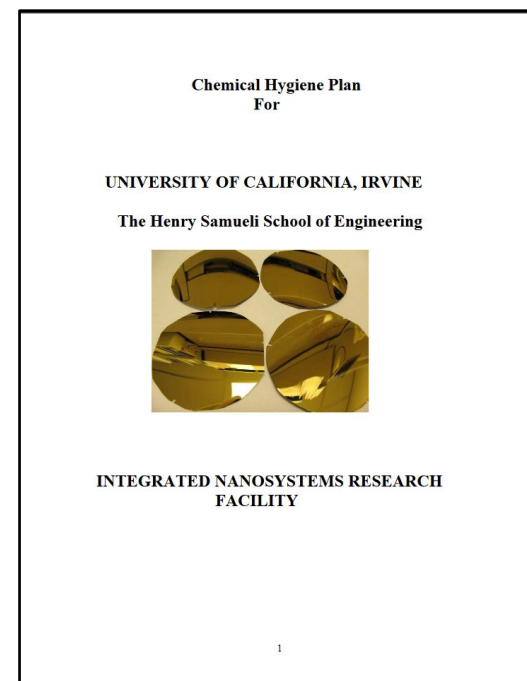
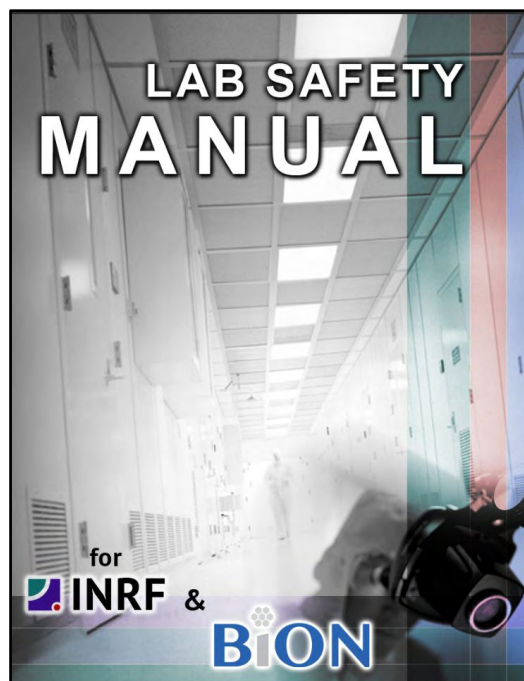
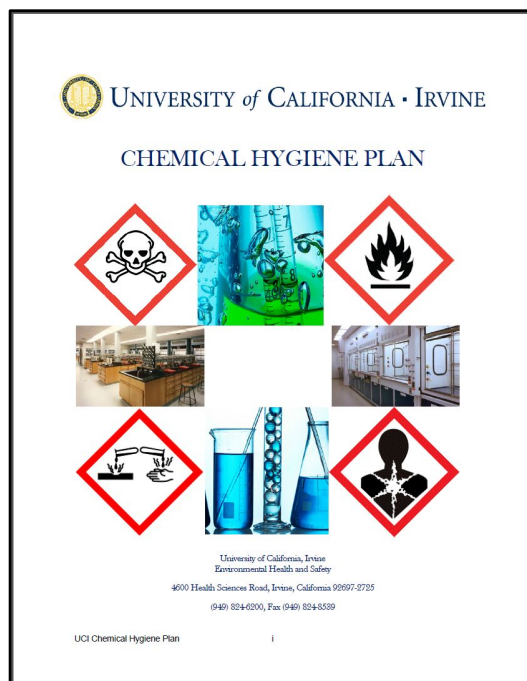
- Hazardous Inventory Management
- Safety Data Sheets
- Labeling and Warning Signs
- Laboratory Hazard Assessment Tool (LHAT)



Reducing Chemical Exposure



Getting Additional Information



Recent Notables in INRF/BiON

- Development of Standard Operating Procedures (SOPs) for Hazardous Materials and Processes
- Hazardous Material Inventory Management
- Hazardous Waste Management

SOPs Development

Three principal types of SOPs

- Hazard Band Specific
- Chemical Specific
- Process Specific



Components of an SOP:

- Standardized SOP template
- Detailed Laboratory Specific Procedures
- Principal Investigator/Supervisor verification
- Researcher/Laboratory Worker assignment and verification

Hazardous Material Inventory Management

- Adhere to INRF/BiON policies regarding personal use chemicals and bringing in new reagents
- When work concludes or when reagents are no longer being used follow procedures for removing or disposing of unneeded reagents



Hazardous Waste Management

- No significant problems
- Keep up the good work!

Questions

If you have any questions or concerns, please let us know!

Chemical Safety

chemsafety@uci.edu

Environmental Health & Safety

safety@uci.edu

(949) 824-6200

x-4-6200

To report an injury or safety concern:

<https://www.ehs.uci.edu/apps/hr/>

All Hands on

Kasra Karimian
Process Safety Engineer



A bit about me!

- Studied Chemical Engineering in Iran
- After 5 years started my Masters
- Different rules, different environment, and facing to new hazards.
- Got my masters in Chemical Engineering
- Work as a “Process Safety Engineer”



EH&S

Environment Health and Safety

“Supporting the campus community by proactively protecting people, property and the environment in a responsible and cost effective manner.”

- **What is EH&S responsibilities?**

1. Environmental protection
2. Occupational health
3. Safety at work

- **EH&S general Objectives?**

1. Prevention of incidents or accidents from abnormal operating conditions.
2. Reduction of adverse effects that result from abnormal condition



General Safety



General safety and work performed in office or classroom settings.

Laboratory & Research



Research and teaching lab safety policies, procedures, and services.

Maintenance & Skilled Trades



Maintenance, grounds, custodial and other skilled trades.

Report an Injury/Safety Concern

News & Highlights



Free! Lab Hot Plate Replacement

- [Public Health Updates](#)
- [Safety on Site \(SOS\)](#)
- [UC Irvine Smart Labs Initiative](#)

Quick Links

- [BSAS Project Submission](#)
- [CIBR-Trac-Hazardous Materials Inventory](#)
- [Empty Containers](#)
 - [Request](#)
 - [Self-Service](#)
- [Ergonomic Evaluation](#)
- [Hood Permit - Temporary](#)
- [Hazardous Waste Pickup](#)
 - [Fax a Pickup](#)
 - [Biomedical](#)
 - [Chemical](#)

Auxiliary Services



Police, Childcare, Dining Services, Student Housing and etc.

Risk Services



Insurance programs, claims services, and risk consultations.

Forms & Online Services



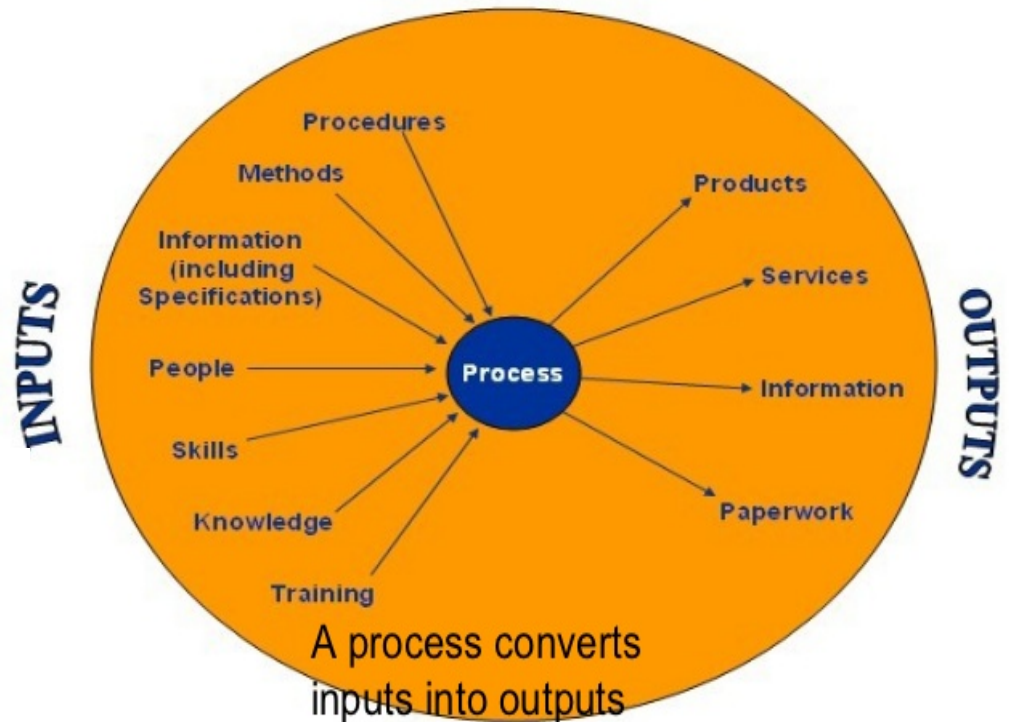
Access to safety training, hazardous waste disposal services, and etc.



What is Process?

*A series of activities that leads
to a desired outcome.*

THE CREATIVE PROCESS



Process Safety

- Prevention of incident, prevention and mitigation of fires, explosions, and accidental chemical and gas releases.

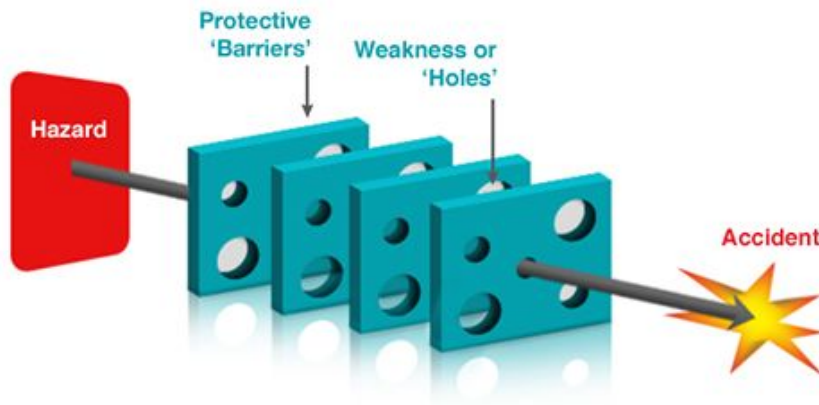
Hazard vs. Risk

Hazard:

The inherent nature of a substance or a potentially unsafe condition or situation

Risk:

function of both probability that something might happen and the expected consequences if it does.



Explosion at University of Hawaii

Thea Ekins-Coward

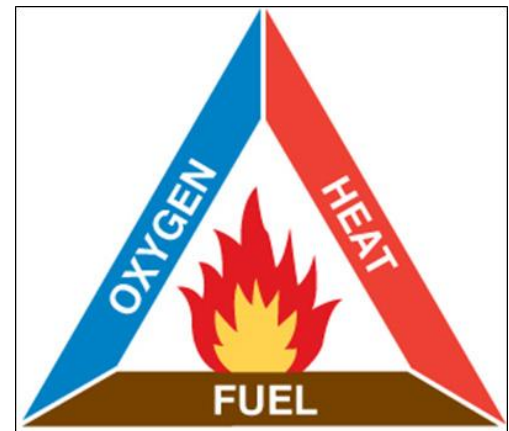
*Postdoctoral researcher at
University of Hawaii*

*Consequences: Loss of
her arm*



What and How it Happened!?

- She was working alone in the lab.
- Used a mixture of hydrogen, carbon dioxide, and oxygen inside a low pressure tank.
- Electronic gauge which was used to measure the pressure inside the gas mixing vessel, created spark.
- Electronic gauge was not designed to be used in system containing a flammable mixture of gas.



What and How it Happened!?

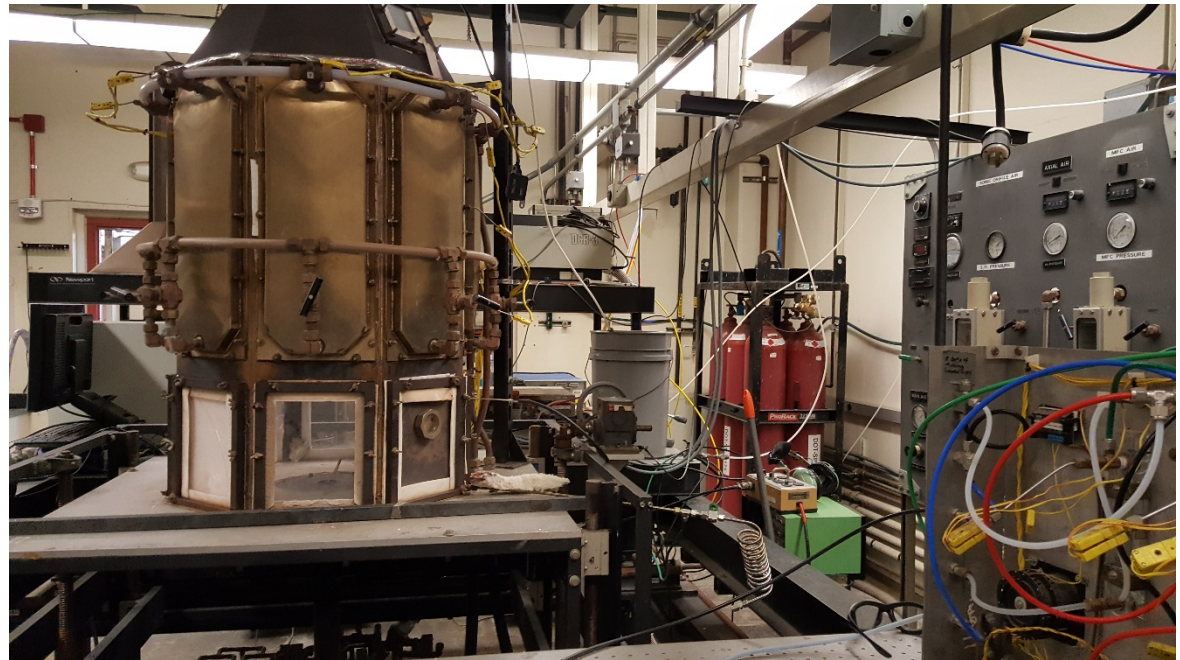
- There was no written safety plan for this experiment.
- The new apparatus had not been evaluated by a safety professional or engineer.
- A smaller explosion had occurred the week prior.

The screenshot shows the UCI Environmental Health & Safety and Risk Services website. The navigation bar includes links for Laboratory & Research, Maintenance & Skilled Trades, Risk Services, and How to Use. The main content area features several service categories: General Safety, Laboratory & Research, Maintenance & Skilled Trades, Report an Injury/Safety Concern (circled in red), News & Highlights, Free Lab Hot Plate Replacement, Auxiliary Services, Risk Services, and Forms & Online Services. A Quick Links section is also present, listing various safety-related procedures and services.

Explosion at APEP lab

Two UCI employees

*Consequences: Minor
burn on the lower left side
of the neck and a cut to the
right hand.*



What and How it Happened!?

- She was preparing for the experiment.
- Second gas line was added, but she forgot to close it before igniting the ignitor.
- Poor workstation design
- Confusing piping and completely manual.
- No flammable gas monitoring inside the furnace.
- No mothballing of equipment.
- Housekeeping problems.



How to manage hazards?

- Perform a **hazard assessment** whenever you design or reproduce an experiment involving high-hazard materials or equipment.
- Write a **Hazard Control Plan (HCP)** to document the safety controls that you'll use in your design to reduce the likelihood and/or severity of an adverse event.
- Take into consideration how changes in the procedure, such as scale or equipment, will affect the safety of the experiment.
- Contact **EHS** for assistance with your hazard assessments and HCPs.

Any questions?

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