



■ Improving Safety in the Chemical Enterprise Through Transparent Sharing of Best Safety Practices: *The Dow Laboratory Safety Academy delivers safety information to all*

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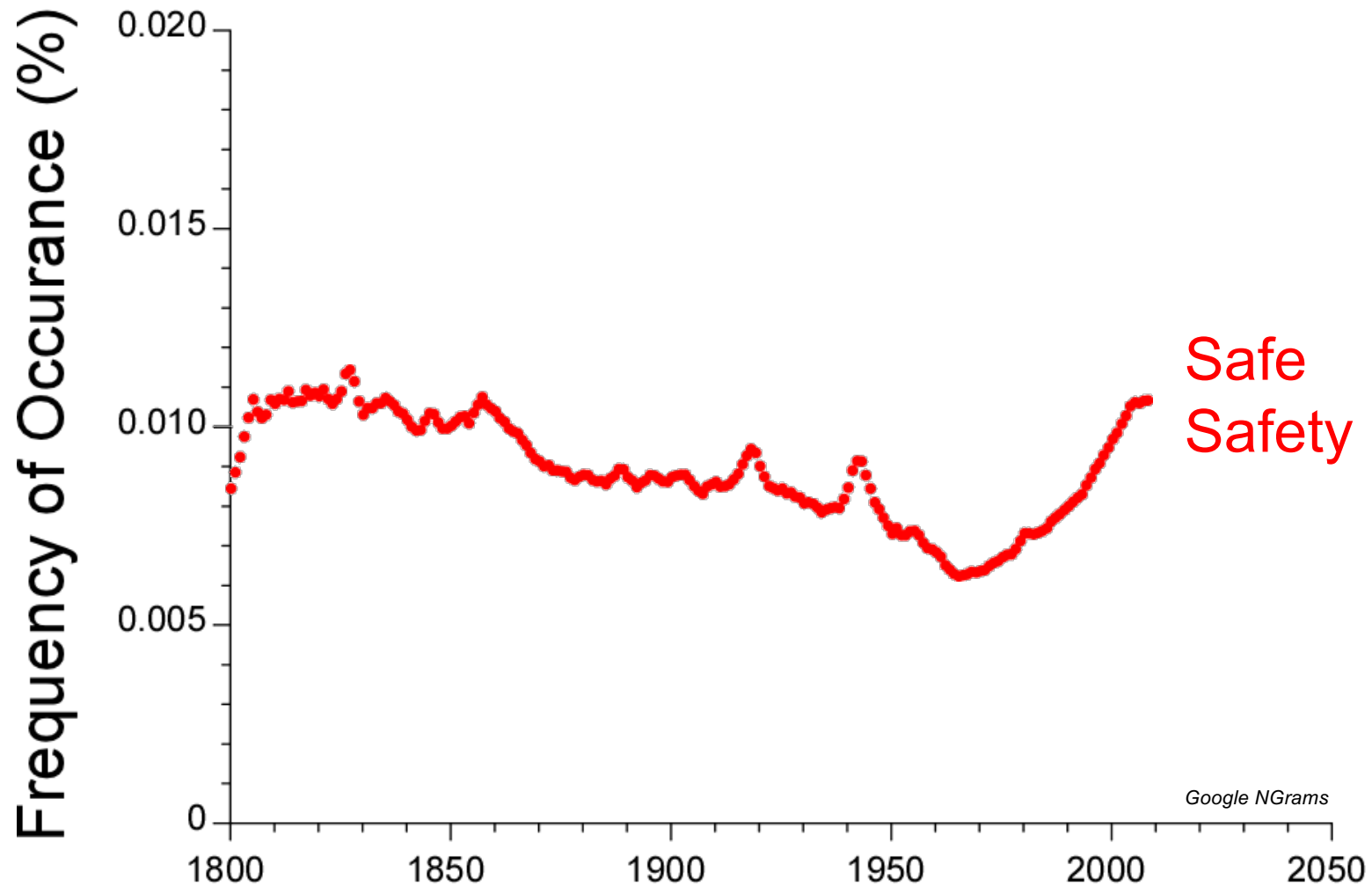
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21 August 2017

Dow.com



Word Usage Is Telling





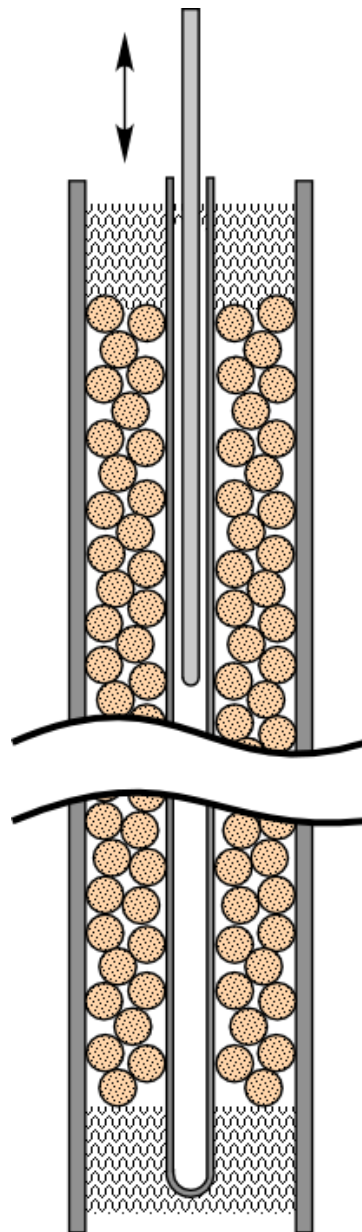


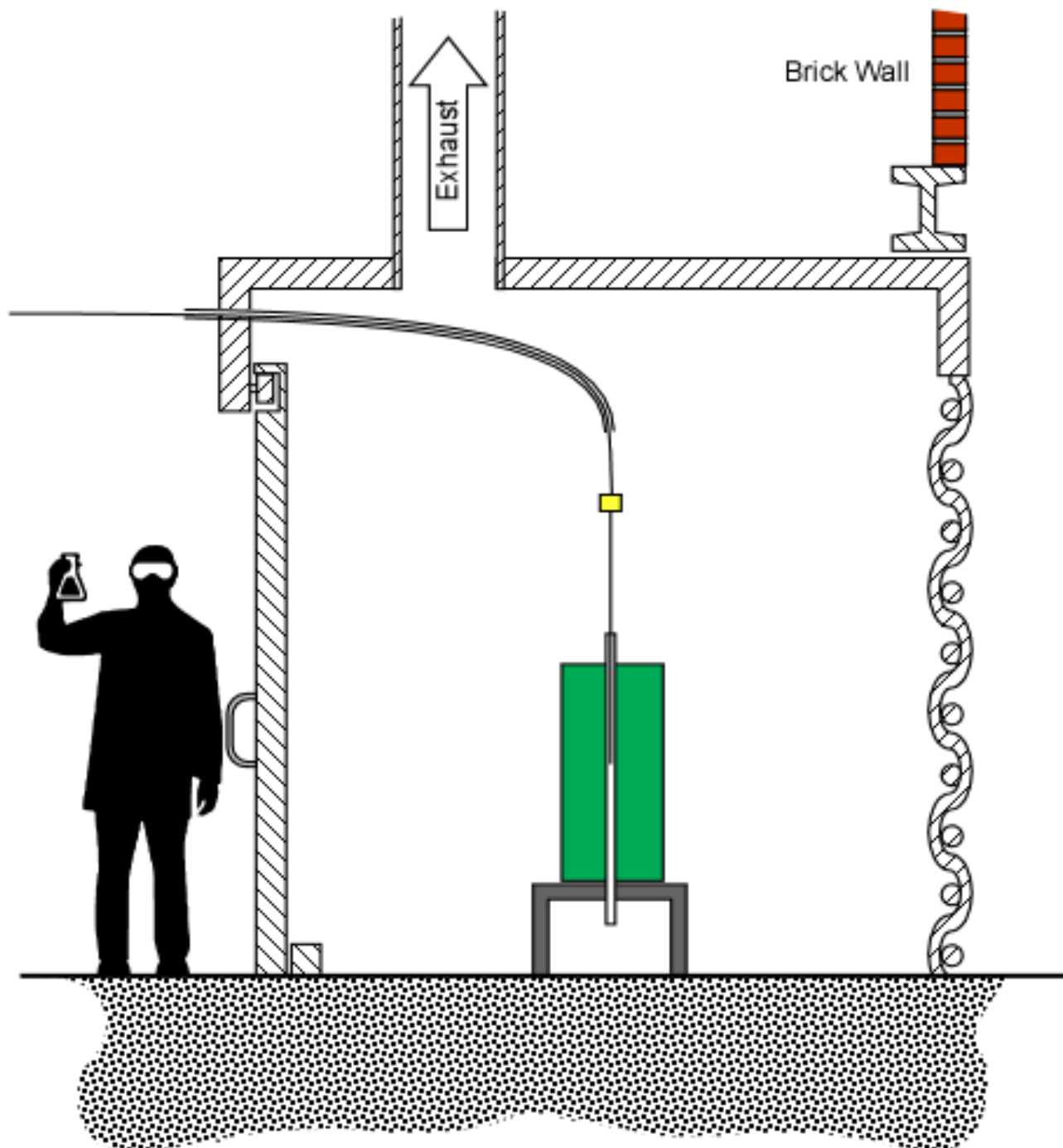
Danger →

← **Risk
Tolerance**

Benefit ↓

Catalysis Research






■ EH&S Expectations @ Dow

Protect People and
Environment

Vision of Zero

Responsible behavior

Three classical columns with fluted shafts and papyrus capitals are arranged in a row. A semi-transparent red rounded rectangle is centered over the middle column, containing text. The columns are rendered in a light gray color with soft shadows.

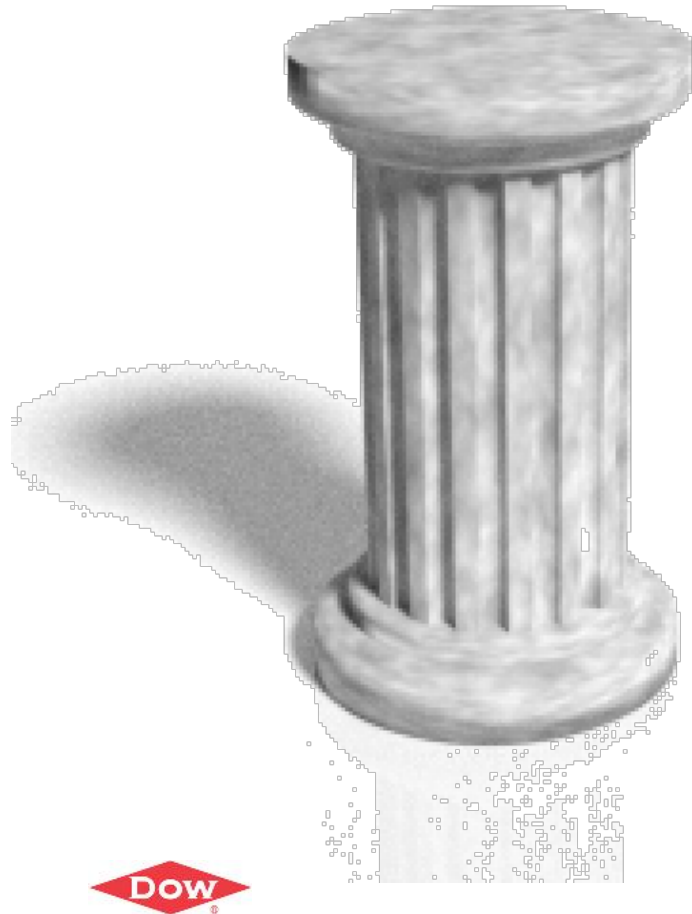
Our goal is to eliminate all injuries, prevent adverse environmental and health impacts, reduce wastes and emissions and promote resource conservation at every stage of the life cycle of our products.

■ EH&S Expectations @ Dow

Responsible behavior

Each employee has a responsibility in ensuring that our products and operations meet applicable government or Dow standards, whichever is more stringent.

All employees, contractors, and visitors are expected to exhibit appropriate and responsible behavior during their presence within a Dow facility.



■ EH&S Expectations @ Dow

Protect People and
Environment

Vision of Zero

Responsible behavior

Bottom Line:

Dow Expects Employees to Go Home Healthy
and Safe....Everyday





Personalization



Culture



Metrics



Organization,
Work Processes,
Operating Discipline



Universities and Industry: *Common Challenges & Opportunities*

- Mindset of Incident Prevention Not Inevitable Incidents
- Organizational Design
- Need and Ability to Share Researcher Experience
- Safety Is Core Not an “Extra”
- Commit to Safety Not Compliance

Researcher Injured in University of Hawaii Lab Explosion

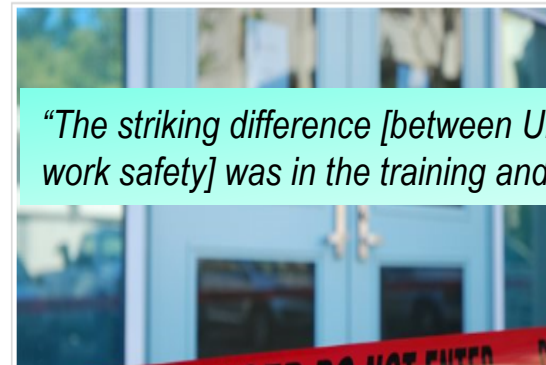
Mon, Mar 21, 2016

AUDREY McAVOY, Associated Press

Victim suffered burns and injuries to her face and arm after explosion

“Safety is a priority and a worker will not be penalized for a delay caused by being safe”

Honolulu Emergency Medical Services spokeswoman Shayne Enright said Thursday the woman was in serious condition after the explosion Wednesday evening.



Honolulu Emergency Medical Services spokeswoman Shayne Enright said Thursday the woman

“The striking difference [between University and work safety] was in the training and awareness”

and
i. She was
medical

Center in serious condition after the explosion Wednesday evening.

No one else was hurt. The researcher was alone in the lab,

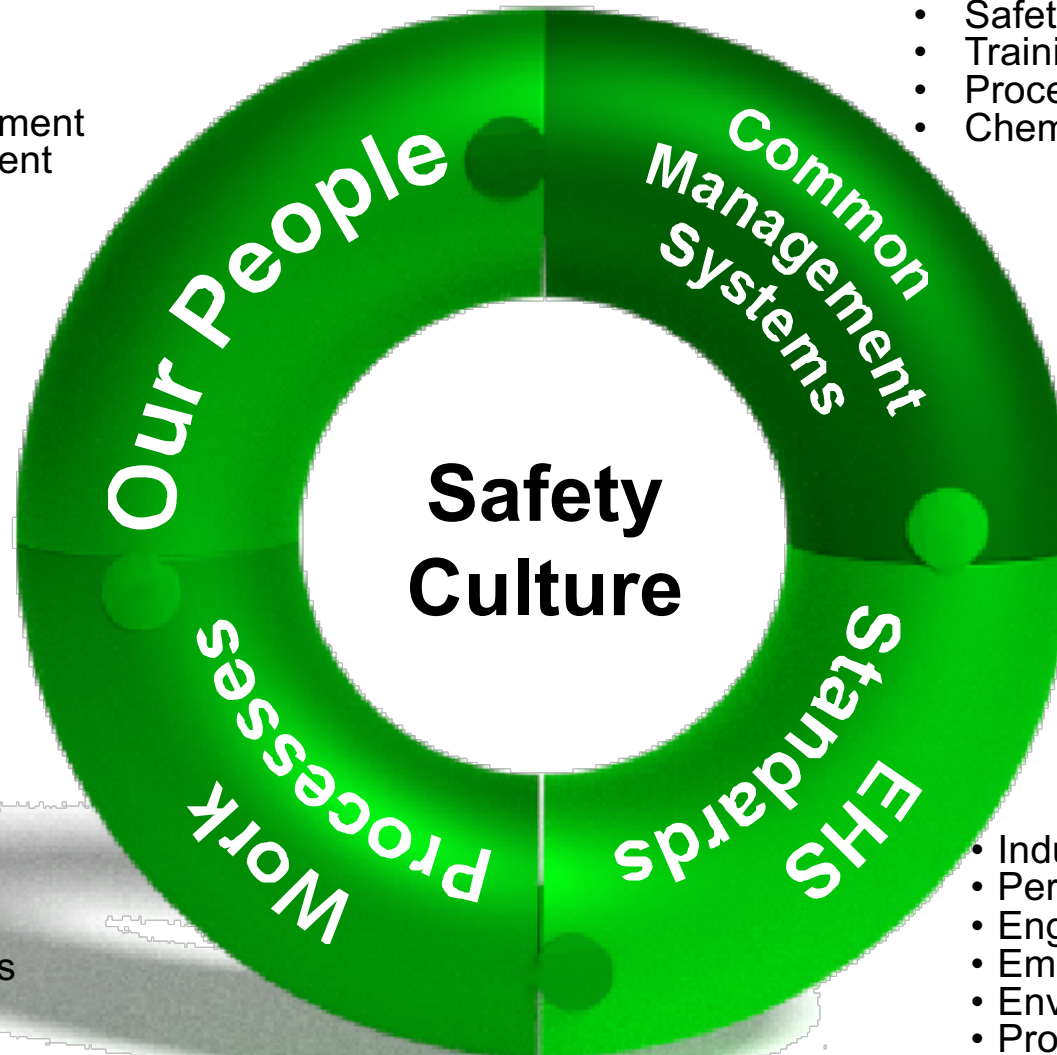
“In Graduate School, pretty much every reaction was run wearing only safety glasses, thin nitrile gloves and maybe a lab coat. Having access to the appropriate PPE has been a major change.”

The researcher was growing cells by feeding them a mixture of low-pressure hydrogen, carbon dioxide and oxygen, said Brian Taylor, the dean of the School of Ocean and Earth Science and Technology. The same process has been used almost daily and without incident since the project began in 2008, he said.

Safety Culture

- Leadership Engagement
- Employee involvement

- Safety Goals & Metrics
- Training
- Procedures
- Chemical Hygiene Plan

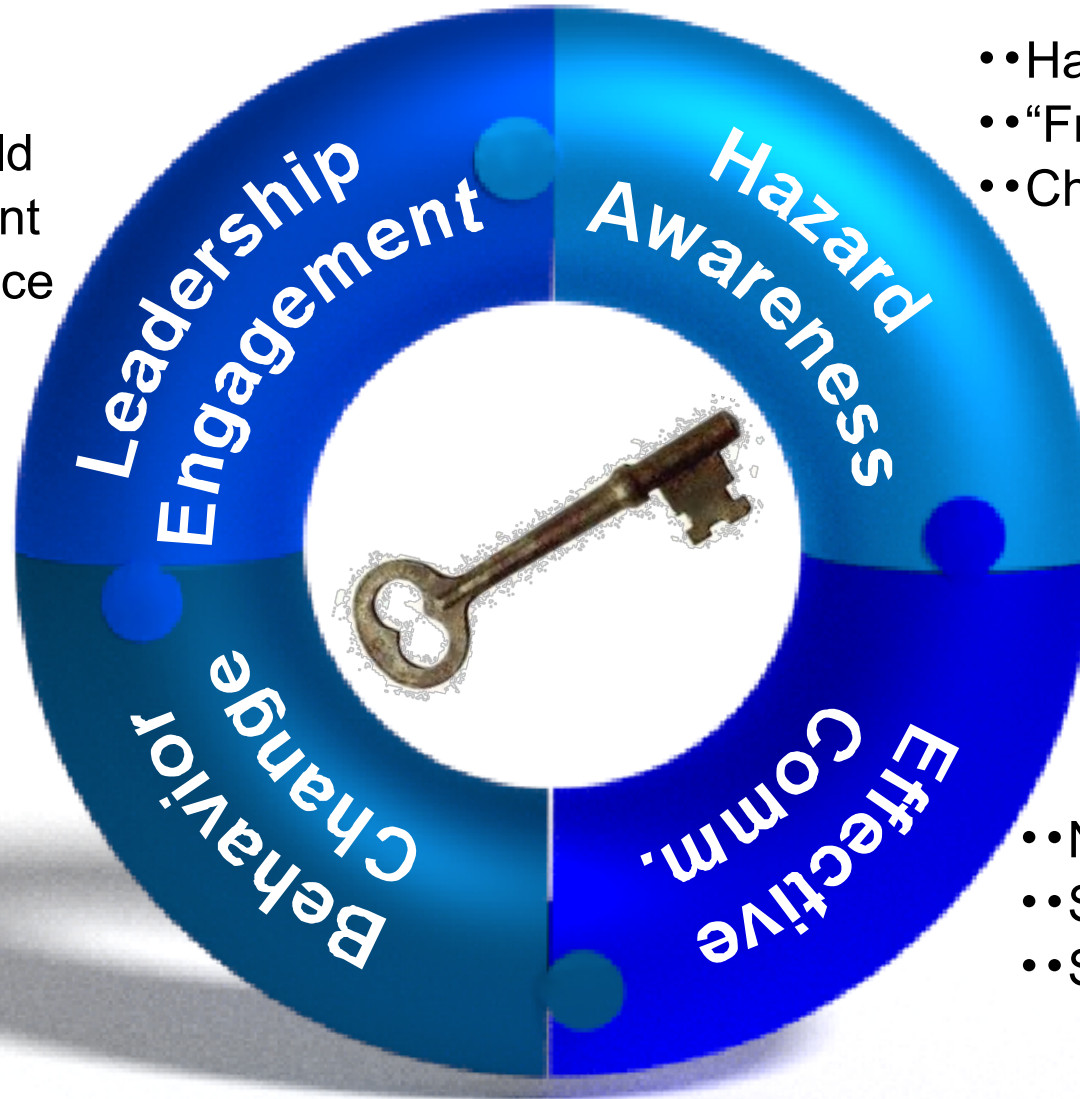


- Hazard
- Assessment
- Managing Change
- Inspections
- Audits
- Incident Investigations

- Industrial Hygiene
- Personal Safety
- Engineering Design
- Emergency Response
- Environmental
- Process Safety
- Product Sustainability

■ Key Elements of a Sustainable Safety Culture

- Set Expectations
 - Visible in the Field
 - Show commitment
 - Ensure compliance



- Hazard recognition
- “Fresh eyes” approach
- Change management

- Make safety personal
- Intervention culture
- Positive reinforcement

- Near miss events
- Share best practices
- Safety moments

■ R&D Management of Change

Incident
Prevention



Hazard
Awareness



Compliance



Safe
Operations

- All experiments evaluated for hazard mitigation
- Compliance with both internal and external regulations are maintained
- Changes have appropriate reviews and approval
- Documentation related to the change is created or updated
- Documentation centrally located to ensure accessibility
- Appropriate training is conducted
- Notification to affected personnel is completed

■ Transparent Communication





Make it **Personal**

Ask open-ended questions

Create an environment where people
are free to ask questions

Escalate issues

4 key principles that help us institute safety culture

■ PACE Scenario

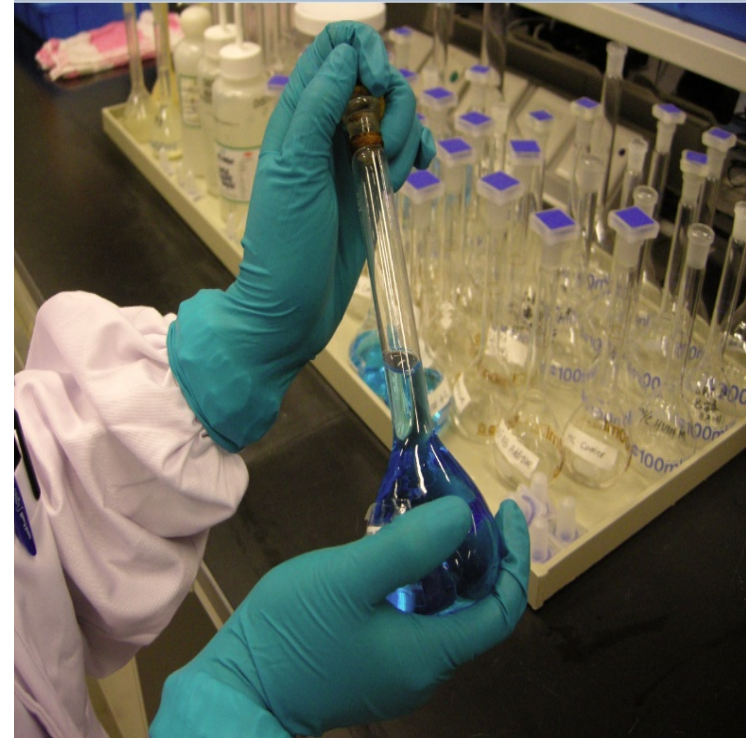
Task:

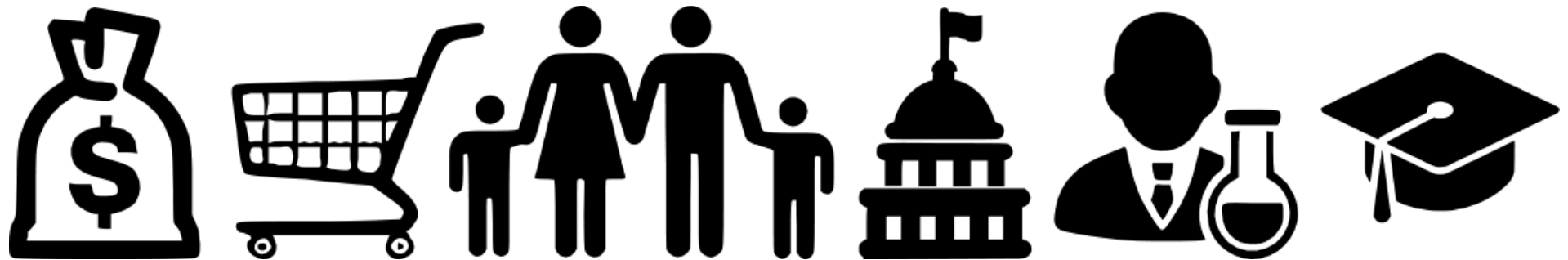
- Make up a standard solution in a volumetric flask consisting of copper sulfate, sulfuric acid and water.

Apply PACE principles to have a safety discussion

- Share Experiences
- Discuss the tasks associated with making the solution
- Ask Open Ended Questions - Consider Hazards

Make it **Personal**
Ask open-ended questions
Create an environment where people are free to ask questions
Escalate issues

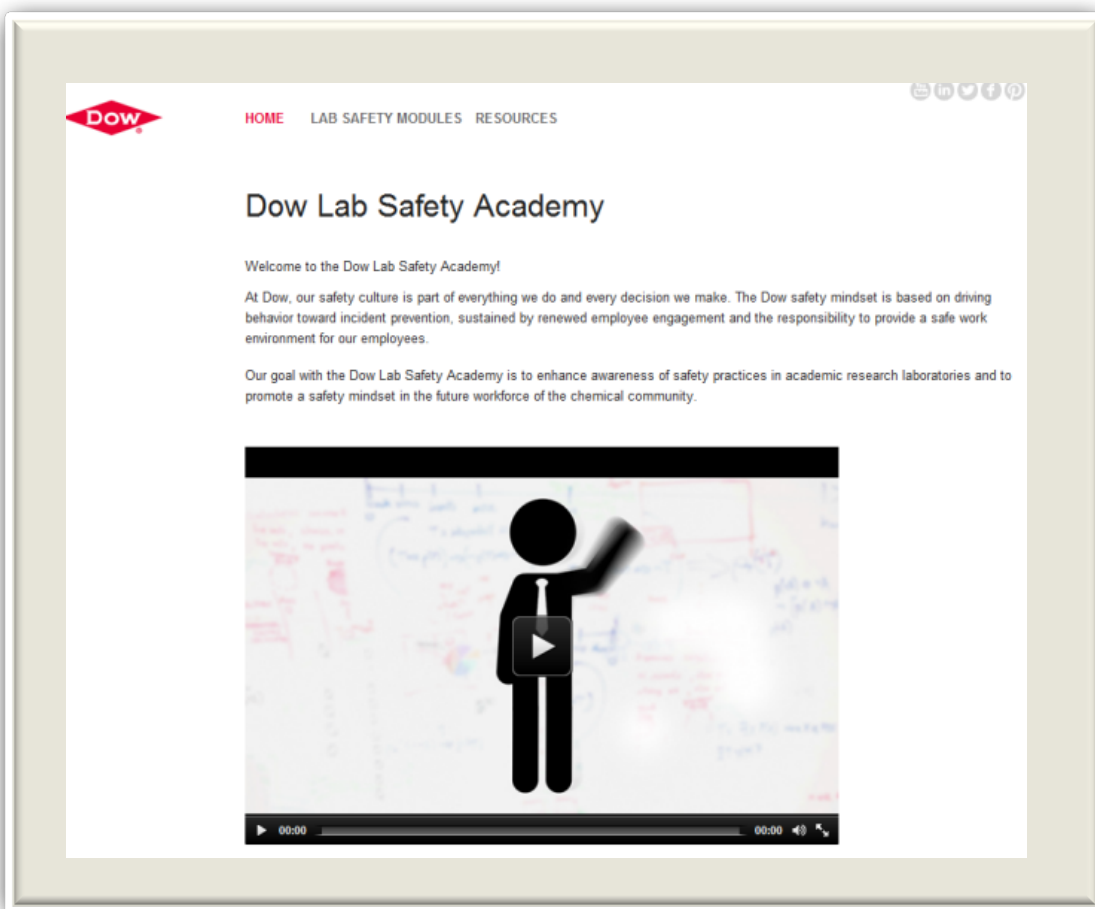




Dow Lab Safety Academy

Since 2013 Launch...

- 25,000+ enrolled viewers
- >250,000 views
- >60 universities
- >40 Government Agencies & National Labs
- >100 companies
- 10 countries
- 1 external award
- More than a dozen media stories



<http://safety.dow.com>







Dow Lab Safety Academy – Modules

Safety Orientation & Training	Specialized Topics	Plan, Evaluate, & Execute	Sustainable Safety Culture
Ergonomics Fall Prevention Personal Protective Equipment Waste handling Secondary containment Housekeeping Electrical Safety Fire Extinguisher Lone Worker	Fume hood Gas cylinder Glassware Handling Mechanical Integrity Vacuum Equipment Biological Hazards Nanoparticles Cryogenics Pyrophorics	Management of Change Hazard Assessment Safe Operation Cards Reactive Chemicals Energy Calculations Interpreting Safety Data Sheets Chemical Labeling Sample Transportation & Shipping Line of Fire	Making Safety Personal Inspections Interventions Recognition Mentoring Near Miss Reporting Learning Experiences Effective Safety Communications Sustainability Leadership Engagement

Fume Hood Basics

