



# A Step in the Right Direction

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## A different path

- Then...
  - Divisions pushing awareness, tool kits, programming
  - ACS was not willing to climb this mountain, many missed opportunities
- Now...
  - Divisions pushing awareness, tool kits, programming – THANKYOU!
  - Recognition by ACS that ACS is the natural owner of chemical laboratory safety
  - Support for integration throughout Society programming, *i.e.* Core Value



# Great expectations

- What's different?
  - Purpose
    - Profit vs. Education/Training
    - Applied research often utilizing resources from private and public sectors vs. fundamental research utilizing public and private resources
  - Governance
    - BOD and share holders vs. institution administration and funding agencies
  - Expectations and Consequences
    - Expectations: what is required vs. what is expected
    - Consequences: are well understood
- What's the same?
  - Good science
  - Regulations for research labs
  - Initial training
  - Human element
  - A strong program takes effort and top-down support



## What does this mean to me?

- You may have to change how you conduct your business
  - Drop into the lab more often
  - Create a non-adversarial environment
  - Make an up-front time investment
  - Make a post-event “insurance” investment



## Three components

- Assess risk
- Provide control
- Learn from experiences



## Assess the risk

- Risk
  - How likely is this to happen?
  - What's the worst that can happen?
  - Is there another way to do this?
  - Change management
- Specialized training
  - How to read labels, safety information, where to get additional info (annual training refresher)
    - ID of hazards in area
    - Hazards of materials
  - Safe work practices



## Provide Control

- Can you control the risk with equipment or an alternate process?
  - Check valve
  - Double block
  - Lower pressure, temperature, volume
- Review all of the pieces
  - Chemistry, process, materials, materials handling, disposal, control systems, pressure, electrical, moving parts, fail-safe devices
  - Is additional training needed?
- PPE is your LAST measure of protection, it should not be the only measure

...and what did  
we learn from  
this?



- When things go awry... root cause analysis
  - What is the response to unplanned events?
  - Ask “why?”
    - For every effect, there is a cause
    - 5 times
  - Post-event analysis makes good business sense
    - Learn the causes of problems and permanently eliminate them
    - Avoid wasting money on needless repairs
    - Improve processes and systems



# Consequences



- Exist and are situation dependent

# What can be done *today*?



- No/ low cost options
  - Utilize your natural curiosity to learn
    - Daily habits – ask questions!
    - Learn about Root Cause Analysis and use it
  - Publications
    - Include safety information as part of your experimental sections
    - Include safety information as part of your discussion sections
  - Seminars
    - Ask questions
    - Encourage students to ask questions
  - Teaching labs
    - Ask questions
    - Encourage students to ask questions
    - Test their knowledge
  - Research labs
    - Clean them!
    - Share information



Keep walking



- Be a leader
  - Create working conditions that minimize risk
    - Require and exemplify safe behavior
    - Create an “open” atmosphere for discussion
  - Review work before it begins
  - Learn from and share lessons from unplanned events
    - It is much more efficient to get it right up front
    - It will save you time and money in the long run

