

Communicating Chemical Safety

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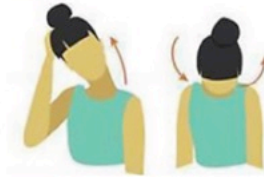
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- Even if you have an ergonomic workstation, working at a computer can still cause muscle pain due to a lack of movement.
- You can solve this by going for walks, but a stretching routine also helps.
- You can do these stretches periodically or whenever you feel stiff.



• Neck Rolls



• Wrist Stretch



• Seated Leg Stretch With Fold



• Spinal Twist



• ABC Ankle Roll



• Forward Fold

Weekly Safety Toolbox 06/29/18

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Background and agenda

- Relation of this topic to the ACS Safety Summit
- Background on the influences of the National Research Council
- Overview of sections of ***Safe Science: Promoting a Culture of Safety in Academic Chemical Research***
- Use of this and other information in the communication efforts related to safety as a core value of the American Chemical Society



Excerpts throughout these slides are taken from *SAFE SCIENCE: Promoting a Culture of Safety in Academic Chemical Research* published by The National Academies Press in Washington, DC 2014

Thought process behind Chapter 2

- “Is there another way to look at instilling stronger safety practices in chemical research?”
 - Technical subject matter experts, research leaders, early career PIs, administrators, social scientists
- Approach to occupational safety research, practices and management have evolved through three stages
- Different industries or sectors offer approaches that may be of value to the chemical enterprise
- Changes that impact entire organizations or disciplines take time and intense effort – why? – how does this influence what we can and should do in the ACS?

First Stage in the Journey: Technology Period

- Rule-based; most basic OSHA expectations come during this period
- Ability to meet the most basic expectations
- Hierarchy of controls
- Libraries of information
- Standard operating procedures
- Not a lot of flexibility in this mode of thinking.
- Limited worker engagement
- Sufficient to control simple, linear chains of events

Organizations in this stage are first motivated by keeping people safe, but are often also motivated by regulations, liability, and returns on investment.

Second Stage in the Journey: Systems-Based Management

- Everything in the first stage remains relevant
- Organizations at this stage of maturity recognize other factors
 - Design
 - Testing/readiness
 - Human behavior and human performance factors
 - Active and latent failures
 - Training effectiveness, not just delivery
- Recognition exists that entire systems can degrade subtly over time; therefore, mechanisms exist to recognize drift - oversight
- Emphasis is placed on learning; but may fall short of evolutionary change

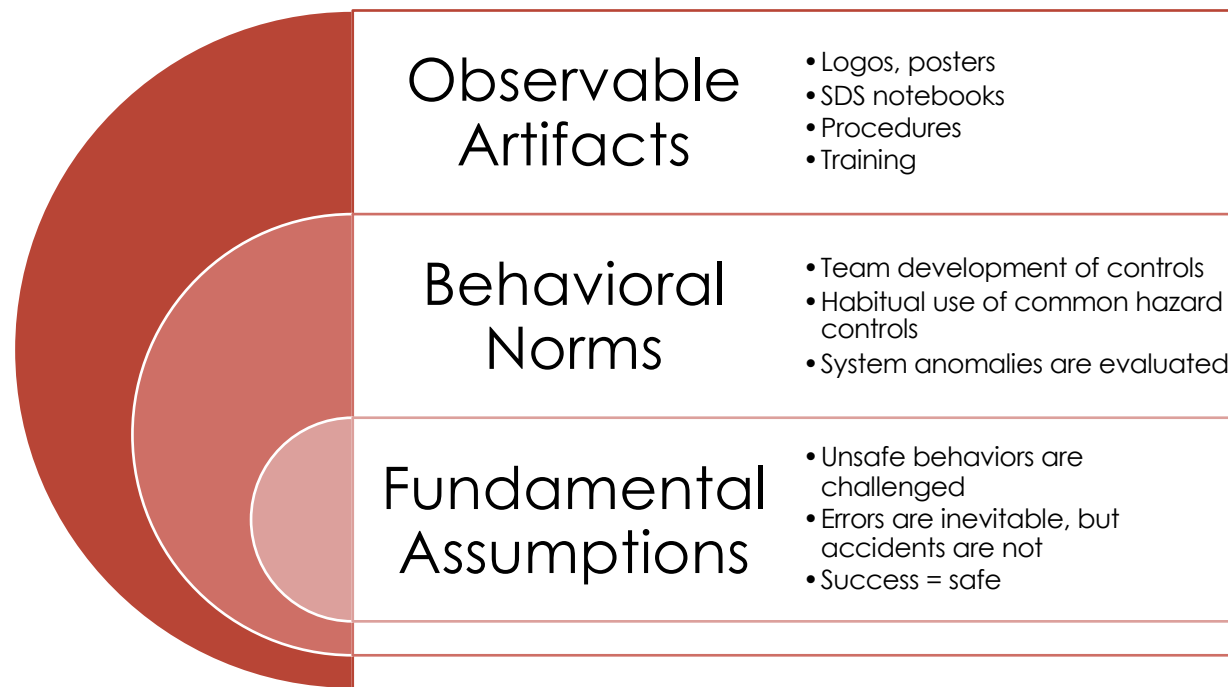
Organizations in this stage often use consensus standards and are motivated by competitive advantage and a need to make things consistent for high hazard operations.

Third Stage in the Journey: Safety Culture

- Clearly understood that “it is not enough to provide safe equipment, systems, and procedures if the culture of the organization does not support safe working”
- Workers that do not assimilate to and processes that do not support the organization’s values, beliefs and underlying assumptions are recognized as a threat to the organization.
- Value is placed on
 - Importance of safety
 - Free exchange of safety-related information; including hazards and concerns
 - Problem solving over blame
 - Management commitment and involvement
 - Drive to get better

Organizations at this stage are often motivated by “community”, leadership and developing their employees.

Another way to think about it (organizational culture)



Lessons learned from other industries

- Health Care

- Error rates increase with decentralization and fragmentation
- Using management systems that focus on core needs (Safety, effectiveness, timeliness, efficiency, uniform treatment)
- The concept of High Reliability Organizations
 - Sensitivity to operations – quick to identify anomalies and react
 - Reluctance to simplify
 - Preoccupation with predicting potential failures – Not the same thing as paranoia
 - Deference to expertise
 - Resilience

- Industrial Research Facilities

- Foundations in regulatory requirements like Chemical Process Safety
- Consensus standards for safety management (performance-based)

Lessons learned from other industries

- Nuclear Industry
 - Defense in depth, redundancies, quality assurance
 - One of the first to recognize the importance of “Safety Culture”
 - Caution – pendulum has swung to the side of regulating culture

Our conundrum within the ACS:

We have members from different industries, with different levels of understanding, working or studying in institutions at varying stages of maturity, and motivated by different things

Communication strategies and tools that will help people at various stages of their journey

Technology Focused

- Advice for implementing OSHA standards
- Sources of searchable information
- Procedures for safe chemical operations
- Posters and videos
- Training on basic concepts
- Thought processes like RAMP
- Hazard evaluation techniques

Standards Focused

- Standards for high quality laboratory operations
- Forums to compare best practices
- Lessons learned that are transferrable
- Case studies and vignettes
- Techniques for evaluating drifts in behaviors or expectations

It's all about them!

Culture Focused

- Set of core supporting concepts that can motivate the community
- Visible and compelling message from leadership
- Recognition for people and institutions that excel
- Clarity that safe science = successful science
- A plan that continually evolves

Current activities

- Continuing to build a communications plan around the safety messaging that defines what the ACS wants to be to members and the public
- Inventory of communication methods and resources
 - Inventory of safety content in current publications
 - Identifying newsletters that may be avenues to reach a variety of populations; creating newsletter
- Strategy for collecting, cataloging and storing content for reuse
- Development of case studies
- Messaging for ACS leaders to use with various audiences
- Booth redesign and messaging
- Safety video guidelines
- Webinars and other mechanisms for sharing best practices

Eight principles that influence behaviors and form the basis for a strong safety culture

- Everyone is personally responsible for ensuring safety operations
- Leaders value the safety legacy they create in their discipline
- Staff raise safety concerns because trust permeates the organization
- Cutting-edge science requires cutting-edge safety
- A questioning attitude is cultivated
- Learning never stops
- Hazards are identified and evaluated for every task, every time
- A healthy respect is maintained for what can go wrong

--Battelle's *Safe Conduct of Research Principles*